

IDENTIFICATION

PRODUCT CODE: MAINDEC-12-DIAC-D
PRODUCT NAME: EXTENDED MEMORY CONTROL
(EXTMC12)
DATE CREATED: JUNE 19, 1970
MAINTAINER: DIAGNOSTIC GROUP
AUTHOR: HAROLD LONG

1.

ABSTRACT

PDP-12 Extended Memory Control Test (Version 2) is designed to exercise all functions of memory control available to a PDP-12 with at least 4K of additional memory. This includes data field control, data handling, interrupts, data field-instruction field control during an interrupt, auto indexing in extended memory, subroutine handling (both with and without interrupts), and non-existent memory detect handling. All these tests are performed both in P mode and L mode whenever possible.

Program Control is handled by a monitor resident in bank 0. Several options are available to the user for control of error handling.

2.

REQUIREMENTS

2.1 EQUIPMENT

- a) Any PDP-12 with at least 4K of extended memory.
- b) An ASR-33 teletype or equivalent

2.2 PRELIMINARY PROGRAMS

- a) All basic processor - memory tests should have been run successfully.

3.

LOADING PROCEDURES

3.1 METHOD

This program must be loaded with the binary loader. If you are unfamiliar with the proper binary loading procedures refer to "Appendix A" of this program, otherwise proceed with the following:

- a) Set the teletype reader switch to FREE.
- b) Open the teletype reader and insert the program tape so that the arrows on the tape are visible to and pointing toward the operator.
- c) Close the reader and set the reader switch on START.
- d) Set the teletype front panel switch on ON LINE.
- e) Set the LEFT switches to 7777.
- f) Set the RIGHT switches to 4000.
- g) Set the MODE switch to 8 mode.
- h) Depress I/O preset.

- i) Depress START LS.
- j) When the program tape has been read the ACCUMULATOR must be 0000 if it is not, a read-in error has occurred and one might try reloading the binary loader.
- k) Remove the program tape from the reader.

4.

STARTING PROCEDURES

- a) Set the right switches as outlined in section 5.1, switch settings.
- b) Set the mode switch to 8 mode.
- c) Depress I/O preset.
- d) Depress start 20.
- e) The program, when properly running, will type the contents of the pass counter at the completion of each pass.
- f) Attempting to test non-existent memory may result in false error printout or program destruction.

5.

ERROR ROUTINE

5.1 SWITCH SETTINGS

- a) In general, RSW0-6 allow selection of the error mode. With all switches equal to zero, the sequence would be: (error typeout and halt) - operator selects any additional error modes and depresses continue; machine will respond as directed by right switches.

RSW 00 = 1, SUPPRESS ERROR HALT
RSW 01 = 1, SUPPRESS ERROR PRINTOUT
RSW 02 = 1, SCOPE LOOP ON FAILING ROUTINE
RSW 03 = 1, SCOPE LOOP ON NON-FAILING ROUTINE
RSW 05 = 1, INHIBIT BELL
RSW 06 = 1, INHIBIT PASS COUNTER

- b) RSW 08-11 must contain the amount of memory available, within the range of 8 to 32K.

8K: 001
12K: 010
16K: 011
20K: 100
24K: 101
28K: 110
32K: 111

5.2 ERROR PRINTOUT

- a) The error printout has the following general form:

```
TESTNAME TEST MESSAGE FAILED  
REGISTER REGISTER REGISTER...  
(CONTENTS) (CONTENTS) (CONTENTS)...
```

The message is interpreted as follows:

TESTNAME - The mnemonic code used to identify each test in the listing.

TEST MESSAGE FAILED - What the test is attempting to check, along with the identifier "failed".

REGISTERS - The registers associated with this test; this may be the L mode data field register, the L mode save field register, etc.

(CONTENTS) - The contents of each register identified above.

Consult the listing for further explanation of any error condition encountered.

- b) Following is a list of all possible error printouts:

```
TST01  
CDF OR RDF FAILED (PMODE)  
SENT RCVD
```

```
TST02  
CDF OR RDF FAILED (PMODE)  
SENT RCVD
```

```
TST03  
LDF OR RDF FAILED (LMODE)  
SENT RCVD
```

```
TST04  
LDF OR RDF FAILED (LMODE)  
SENT RCVD
```

```
TST05  
CDF OR RDF FAILED (PMODE)  
SENT RCVD
```

```
TST06  
LDF OR RDF FAILED (LMODE)  
SENT RCVD
```

TST07
PMODE INTERRUPT FAILED

TST08
PMODE LOAD SF OR RIB FAILED
DF SF

TST9A
LMODE INTERRUPT FAILED

TST09
LMODE LOAD SF OR RIB FAILED
DF SF

TST 10
PMODE DF FAILED TO ZERO ON AN INTERRUPT
SENT SF RCVD

TST11
LMODE DF FAILED TO ZERO ON AN INTERRUPT
SENT SF RCVD

TST12
DCA I - TAD I FAILED
BANK LOCN SENT RCVD

TST13
STA - LDA FAILED
BANK LOCN SENT RCVD

TST14
LMODE JUMP SAVE RETURN FAILED FOR NORMAL JUMP

TST15
DJR FAILED TO INHIBIT JUMP SAVE

TST16
LMODE JMP FAILED TO CLEAR DJR

TST17
PMODE JUMP ALTERED CELL 0000

TST18
PMODE IOF ALTERED CELL 0000

TST19
LMODE IOF ALTERED CELL 0000

TST20
PMODE JUMP CLEARED DJR

TST21
DJR INHIBITED PMODE INTERRUPT SAVE

TST22
NON EXISTANT MEMORY READ-BACK FAILED
BANK DATA

TST24
CIF FAILED TO LOAD PROPER IF
SENT TCVD

TST25
LIF FAILED TO LOAD PROPER IF
SENT TCVD

TST26
CIF FAILED TO FIND PROPER MEMORY
SENT RCVD

TST27
PMODE INTERRUPTS NOT INHIBITED BY CIF
BANK

TST28
LMODE LIF FAILED TO INHIBIT INTERRUPTS
BANK

TST29
LMODE JMP Ø FAILED TO CLEAR INTERRUPT INHIBIT
BANK

TST30
LMODE DJR-JMP Ø FAILED TO LOAD IF
BANK

TST 32
LMODE ION-LIF FAILED TO INHIBIT INTERRUPTS

TST32
LMODE LIF-JMP N FAILED TO LOAD SF
IF DF SF

TST34
LMODE RMF IN EXTENDED BANK FAILED
BANK SF

TST35
PMODE AUTO-INDEX FAILED
BANK CELL ADDR

TST36 LMODE AUTO-INDEX FAILED
FIELD LOCN

EXT MEM TST PASS ---- ØØØØ

SPURIOUS INTERRUPT
(CHECK IOC I/O PRESET)

/PDP-12 EXTENDED MEMORY TEST, VERSION 2. MAINDEC 12-D1AC-L
/COPYRIGHT, 1970, DIGITAL EQUIPMENT CORP., MAYNARD, MASS.

/AUTHOR: HAROLD LONG

/THIS TEST IS DESIGNED TO EXERCISE ALL MEMORY
/REFERENCE INSTRUCTIONS AVAILABLE ON A PDP-12
/COMPUTER WITH EXTENDED MEMORY. IT OPERATES
/IN BOTH P MODE AND L MODE, IN ALL AVAILABLE
/MEMORY; A MINIMUM OF 8K OF CORE IS REQUIRED.

/RIGHT SWITCH REGISTER OPTIONS:

/SR00=1, INHIBIT ERROR HALT
/SR01=1, INHIBIT ERROR PRINTOUT
/SR02=1, SCOPE LOOP ON FAILING ROUTINE
/SR03=1, SCOPE LOOP ON NON-FAILING ROUTINE
/SR05=1, INHIBIT BELL
/SR06=1, INHIBIT PASS COUNTER PRINTOUT
/SR09,10,11 -- EXTENDED BANKS

/NORMAL SWITCH SETTING IS RSW=0000, WHERE
/(N)=AMOUNT OF EXTENDED MEMORY AVAILABLE AND
/IS WITHIN THE RANGE OF 0<N<10 OCTAL

/PROGRAM CONTROL IS HANDLED BY A MONITOR RESIDENT IN BANK 0,
/LOCATIONS 5000 TO 5177. ALL ROUTINES VISIT THE MONITOR 4096 TIMES
/AT THE COMPLETION OF A TEST, AN ERROR WILL CAUSE THE
/PROGRAM TO TYPE OUT THE ERROR MESSAGE AND HALT. THE
/HALT IS AT LOCATION 5033. THE HALTS IN THE PROGRAM
/BLOCKS ARE NOT, REPEAT NOT, EXECUTED. THEY ARE
/THERE FOR MANUAL PROGRAM CONTROL ONLY.

/TO REDEFINE AMOUNT OF MEMORY AVAILABLE, THE
/PROGRAM MUST BE RESTARTED.

/I/O PRESET TO PMODE, START 20

```

/PDP-12 INSTRUCTION DEFINITIONS
/L MODE MEMORY REFERENCE
LDF=0640
LIF=0600
DJR=0006
/MODE CHANGE
PDP=0002
LINC=6141
/L MODE PROGRAMMING INSTRUCTIONS
LJMP=6000
CLR=0011
AZC=0450
ADD=2000
IOB=0500
LNOP=0016
ROR=0300
LSKP=0456
ROL=0240
BSE=1600
BCL=1540
SET=0060
STC=4000
SRO=1500
LOA=1000
STA=1040
XSK=0220
/ DATA MATRIX SWITCHES
EXITA=7777
EXITB=4444
EXIT=0000
/SPECIAL RESTART SWITCH

```

/USED AS A SWITCH CHECK

/ (REALLY SET I)

/NOP

/JMP

/SWITCH TO P MODE
/SWITCH TO L MODE

/DISABLE JUMP RETURN

/LOAD DATA FIELD 0-37
/LOAD INSTRUCTION FIELD 0-37


```

/P MODE INTERRUPT HANDLER
0000 0000 PINTR, 0000
0001 7320 CLA CLL CML
0002 6234 RIB
0003 3143 DCA
0004 1142 TAD PPINT
0005 7650 SNA CLA
0006 5555 JMP I RETURN
0007 3142 DCA PPINT
0010 6244 RMT
0011 2000 ISZ 0
0012 5400 JMP I PINTR
/AUTO-INDEX REGISTERS
0013 0000 LREG1, 0000
0014 0000 PINT, 0000
0015 0000 AUTO11, 0000
0016 0000 AUTO12, 0000
0017 0000 COUNT, 0000
/CROSS-PAGE REFERENCE TAGS AND CONSTANTS
0020 /
0020 5176 JMP 176 /MINOR START
0021 0003 K0003, 0003
0022 0007 K0007, 0007
0023 0010 K0010, 0010
0024 0017 K0017, 0017
0025 0020 K0020, 0020
0026 0040 K0040, 0040
0027 0070 K0070, 0070
0030 0077 K0077, 0077
0031 0100 K0100, 0100
0032 0177 K0177, 0177
0033 0207 K0207, 0207
0034 0400 K0400, 0400
0035 1026 K1026, 1026
0036 1777 K1777, 1777
0037 2000 K2000, 2000

```


/LMODE INTERRUPT HANDLER

0040	*0040	LINTR, 0000	/INTERRUPT RETURN STORAGE
0041	0011	CLR	/CLEAR LINK, CLEAR AC
0042	0500	IOB	/
0043	6234	RIB	/READ SAVE FIELD REG
0044	4064	STC	/SAVE IT
0045	1500	SRO	/SWITCH SET?
0046	0065	LPOINT	/
0047	0456	LSP	/TO HERE IF BIT 0=1
0050	6050	LJMP	/NO, RETURN TO BANK 0 THROUGH PRESET LINKUP
0051	0500	IOB	/
0052	6244	RMP	/YES, RESTORE MEMORY FIELDS
0053	0220	XSK	/INCREMENT
0054	2040	ADD	/GET RETURN
0055	1020	BSE	/MAKE IT A LINK JUMP (BSE !)
0056	6000	BSE	/
0057	4063	STC	/STORE FOR EXECUTION
0060	4065	STC	/CLEAR SWITCH
0061	0500	IOB	/
0062	6001	ION	/ENABLE INTERRUPTS
0063	6063	LJMP	/BACK TO BANK 0 VIA INTERRUPT RETURN LINKUP
0064	0000	REG,	
0065	0000	LPOINT,	

/MORE TAGS AND CONSTANTS

BANK, 0000	/AMOUNT OF EXTENDED MEMORY
BELL, 5464	/CROSS PAGE TO BELL RINGER
BKSET, 5326	/BANK SET
ERROR, 5020	/CROSS PAGE TO ERROR MONITOR
EXDF33, 2120	
EXIF33, 2121	
GETBNK, 5431	
GETBNL, 5445	/CROSS PAGE TO PMODE FIND BANK
GETBNL, 5252	/CROSS PAGE TO LMODE FIND BANK
K5252, 5252	
K6020, 6020	
K7774, 7774	
KCDF, 6201	/PMODE CDF
KCIF, 6202	/PMODE CIF
KHLT, 7402	/PMODE HLT
KLOF, 0540	/LMODE LDF
KIOB, 0500	
KIOF, 6002	
KLNOP, 0016	
KRIF, 6224	/LMODE NOP
KLIF, 0600	/LMODE LIF
KLJMP, 6000	/LMODE JMP
LBANK, 0003	/LINC FIELD IN USE (>4K)
LMASK, 0037	/LIF/LDF MASK
LASTERR, 0000	/LAST ERROR POINTER
NERROS, 5000	/CROSS PAGE TO NON-ERROR MONITOR
PASSN, 4206	
PBANK, 0000	/PMODE BANK IN USE (<32K)
PMASK, 0070	/CIF/CDF MASK
PNTA, 0122	/INTERUPT RETURN TEST 07
PNTB, 0527	/INTERUPT RETURN TEST 08
PNTC, 0620	/INTERUPT RETURN TEST 09
PNTCA, 0564	/INTERUPT RETURN
PNTD, 0660	/INTERUPT RETURN TEST 10
PNTE, 0722	/INTERUPT RETURN TEST 11
PNTF, 1246	/INTERUPT RETURN TEST 21
PNTG, 1430	
PNTH, 1473	
PNTI, 1605	
PNTJ, 1651	
PNTK, 1734	
PNTL, 2012	
PNT0, 4222	
PNTP, 5423	
PNT30, 2007	
PPOINT, 0000	

0143	0000	PREG,	0000
0144	5200	RANDOM,	RANDY
0145	0000	REGA,	0000
0146	0000	REG8,	0000
0147	0000	REGC,	0000
0147	0000	REGC,	0000
0150	0147	REGCN,	REGC
0151	0000	REGD,	0000
0152	0000	REGD,	0000
0153	5261	RELOC,	0000
0154	0000	RELPT,	PINR
0155	0000	RETURN,	0000
0156	5253	SETFLG,	FLAG
0157	0000	SPACE,	0000
0160	5400	STINT,	INTST
0161	0746	TS12N,	TS12
0162	1004	TS13N,	TS13
0163	1370	TS123N,	TS123
0164	1403	TS124N,	TS124
0165	1556	TS127N,	TS127
0166	1613	TS128N,	TS128
0167	1747	TS130N,	TS130
0170	2033	TS132N,	TS132
0171	2072	TS133N,	TS133
0172	2152	TS134N,	TS134
0173	2400	TS135N,	TS135
0174	5244	TYPE,	TYPOUT

/HOLDS SF

/CROSS PAGE TO RANDOM GENERATOR

/DATA

/DATA

/DATA

/DATA

/DATA

/DATA

/CROSS PAGE TO RELOCATOR SUBR

/CROSS BANK TO INTERRUPT RETURN STORAGE

/PMODE INTERRUPT RETURN IF SWITCH=0

/CROSS PAGE TO FLAG SET ROUTINE

/DATA I/O BUFFER

/CROSS PAGE TO TEST 12

/CROSS PAGE TO TEST 13

/CROSS PAGE TO TEST 27

/CROSS PAGE TO TYPEOUT SUBR

/ TO HERE FROM MINOR START

0176 7410 SKP
0177 4467 MSTART, JMS I BELL
/DON'T RING ON STARTUP, INITIALIZE TEST
/GO RING BELL, RETURN TO TS101

/MAJOR START P MODE, INITIALIZATION ROUTINE

0200 7604 LAS
0201 0022 AND K0007
0202 3066 DCA BANK
0203 3145 DCA REGA
0204 3115 DCA LSTERA
0205 3120 DCA PBANK
0206 3017 DCA COUNT
0207 1021 TAD K0003
0210 3113 DCA LBANK
0211 6201 CDF 00
0212 4560 JMS I TS101

/READ SWITCHES
/SAVE BANK BITS
/AMOUNT OF EXTENDED MEMORY
/CLEAR LOOP COUNTER
/CLEAR OLD ERROR
/CLEAR PASS COUNTER
/SET LBANK TO UPPER MEMORY
/RESTORE DATA FIELD
/TEST FOR NO INTERRUPT

/PMODE
/CAN THE DATA FIELD REGISTER BE LOADED WITH ALL NUMBERS (BINARY COUNT)

0213 1145 TAD REGA
0214 0121 AND PMASK
0215 3146 DCA REGB
0216 1146 TAD REGB
0217 1101 TAD KCDF
0220 3221 DCA *+1
0221 0000 0000
0222 6214 RDF
0223 0121 AND PMASK
0224 3147 DCA REGC
0225 1147 TAD REGC
0226 7041 CIA
0227 1146 TAD REGB
0230 6201 CDF 00
0231 7650 SNA CLA
0232 4516 JMS I NERROR
0233 4471 JMS I ERROR
0234 5475 TS101M
0235 7402 HLT
0236 7610 SKP CLA
0237 0213 TS101

/FETCH TEST NUMBER
/SAVE BITS 06-08
/SAVE FOR OBSERVATION
/FETCH IT
/ADD CDF
/PLACE IT IN ROUTINE
/EXECUTE CDF N
/GET DATA FIELD
/SAVE BITS 06-08
/SAVE FOR TYPING
/FETCH IT
/2'S COMPLEMENT
/COMPARE WITH DATA SENT
/RESTORE DATA FIELD
/INCORRECT IF NOT ZERO
/CHECK WITH MONITOR
/CDF OR RDF FAILED
/MESSAGE POINTER
/ERROR HLT
/GO TO NEXT TEST
/SCOPE LOOP, ISZ LOOP

/PMODE
/CAN THE DATA FIELD BE LOADED WITH RANDOM NUMBERS

0240	4544	JMS I	RANDOM	0242	3146	DCA	REG8	/SAVE BITS 06-08	/GET A RANDOM NUMBER
0241	0121	AND	PMASK	0243	1146	TAD	REG8	/SAVE FOR OBSERVATION	
0242	3146	DCA	REG8	0244	1101	TAD	KCDF	/FETCH IT	
0243	1101	TAD	KCDF	0245	3246	DCA	PMASK	/ADD CDF	
0244	1101	TAD	PMASK	0246	0000	0000	REGC	/PLACE IT IN ROUTINE	
0247	6214	RDF	REGC	0248	0000	0000	REGC	/EXECUTE CDF R	
0249	0000	0000	REGC	0250	0121	AND	REGC	/GET DATA FIELD	
0250	0121	AND	REGC	0251	3147	DCA	REGC	/SAVE BITS 06-08	
0251	3147	DCA	REGC	0252	1147	TAD	REGC	/SAVE FOR TYPING	
0253	7041	CIA	REGC	0254	1146	TAD	REGC	/FETCH IT	
0255	6201	TAD	REG8	0256	7650	CDF	REG8	/2'S COMPLEMENT	
0257	4516	JMS I	00	0258	7650	CDF	00	/COMPARE	
0258	7650	JMS I	ERROR	0259	6201	TAD	00	/RESTORE DATA FIELD	
0259	6201	JMS I	ERROR	0260	4471	SNA CLA	00	/INCORRECT IF NOT ZERO	
0260	4471	JMS I	ERROR	0261	5527	ERROR	00	/CHECK WITH MONITOR	
0261	5527	JMS I	ERROR	0262	7402	MESSAGE POINTER	00	/CDF FAILED	
0262	7402	HLT	00	0263	7610	SKIP CLA	00	/MESSAGE POINTER	
0263	7610	SKIP CLA	00	0264	0240	TS102	00	/ERROR HLT	
0264	0240	TS102	00	0265	0265	TS103	00	/NEXT TEST	
0265	0265	TS103	00	0266	0114	AND	00	/SCOPE LOOP, 152 LOOP	
0266	0114	AND	00	0267	3146	DCA	00		
0267	3146	DCA	00	0268	1146	TAD	00		
0268	1146	TAD	00	0269	1101	TAD	00		
0269	1101	TAD	00	0270	1146	TAD	00		
0270	1146	TAD	00	0271	1101	TAD	00		
0271	1101	TAD	00	0272	3274	DCA	00		
0272	3274	DCA	00	0273	6141	LINC	00		
0273	6141	LINC	00	0274	0000	0000	00		
0274	0000	0000	00	0275	0500	IOB	00		
0275	0500	IOB	00	0276	6214	RDF	00		
0276	6214	RDF	00	0277	0002	PDP	00		
0277	0002	PDP	00	0278	7110	RAR CL	00		
0278	7110	RAR CL	00	0279	3147	DCA	00		
0279	3147	DCA	00	0280	1147	TAD	00		
0280	1147	TAD	00	0281	7041	CIA	00		
0281	7041	CIA	00	0282	1146	TAD	00		
0282	1146	TAD	00	0283	1146	TAD	00		
0283	1146	TAD	00	0284	1146	TAD	00		
0284	1146	TAD	00	0285	1146	TAD	00		
0285	1146	TAD	00	0286	1146	TAD	00		
0286	1146	TAD	00	0287	1146	TAD	00		
0287	1146	TAD	00	0288	1146	TAD	00		
0288	1146	TAD	00	0289	1146	TAD	00		
0289	1146	TAD	00	0290	1146	TAD	00		
0290	1146	TAD	00	0291	1146	TAD	00		
0291	1146	TAD	00	0292	1146	TAD	00		
0292	1146	TAD	00	0293	1146	TAD	00		
0293	1146	TAD	00	0294	1146	TAD	00		
0294	1146	TAD	00	0295	1146	TAD	00		
0295	1146	TAD	00	0296	1146	TAD	00		
0296	1146	TAD	00	0297	1146	TAD	00		
0297	1146	TAD	00	0298	1146	TAD	00		
0298	1146	TAD	00	0299	1146	TAD	00		
0299	1146	TAD	00	0300	1146	TAD	00		
0300	1146	TAD	00	0301	1146	TAD	00		
0301	1146	TAD	00	0302	1146	TAD	00		
0302	1146	TAD	00	0303	1146	TAD	00		
0303	1146	TAD	00	0304	1146	TAD	00		
0304	1146	TAD	00	0305	1146	TAD	00		
0305	1146	TAD	00	0306	1146	TAD	00		
0306	1146	TAD	00	0307	1146	TAD	00		
0307	1146	TAD	00	0308	1146	TAD	00		
0308	1146	TAD	00	0309	1146	TAD	00		
0309	1146	TAD	00	0310	1146	TAD	00		
0310	1146	TAD	00	0311	1146	TAD	00		
0311	1146	TAD	00	0312	1146	TAD	00		
0312	1146	TAD	00	0313	1146	TAD	00		
0313	1146	TAD	00	0314	1146	TAD	00		
0314	1146	TAD	00	0315	1146	TAD	00		
0315	1146	TAD	00	0316	1146	TAD	00		
0316	1146	TAD	00	0317	1146	TAD	00		
0317	1146	TAD	00	0318	1146	TAD	00		
0318	1146	TAD	00	0319	1146	TAD	00		
0319	1146	TAD	00	0320	1146	TAD	00		
0320	1146	TAD	00	0321	1146	TAD	00		
0321	1146	TAD	00	0322	1146	TAD	00		
0322	1146	TAD	00	0323	1146	TAD	00		
0323	1146	TAD	00	0324	1146	TAD	00		
0324	1146	TAD	00	0325	1146	TAD	00		
0325	1146	TAD	00	0326	1146	TAD	00		
0326	1146	TAD	00	0327	1146	TAD	00		
0327	1146	TAD	00	0328	1146	TAD	00		
0328	1146	TAD	00	0329	1146	TAD	00		
0329	1146	TAD	00	0330	1146	TAD	00		
0330	1146	TAD	00	0331	1146	TAD	00		
0331	1146	TAD	00	0332	1146	TAD	00		
0332	1146	TAD	00	0333	1146	TAD	00		
0333	1146	TAD	00	0334	1146	TAD	00		
0334	1146	TAD	00	0335	1146	TAD	00		
0335	1146	TAD	00	0336	1146	TAD	00		
0336	1146	TAD	00	0337	1146	TAD	00		
0337	1146	TAD	00	0338	1146	TAD	00		
0338	1146	TAD	00	0339	1146	TAD	00		
0339	1146	TAD	00	0340	1146	TAD	00		
0340	1146	TAD	00	0341	1146	TAD	00		
0341	1146	TAD	00	0342	1146	TAD	00		
0342	1146	TAD	00	0343	1146	TAD	00		
0343	1146	TAD	00	0344	1146	TAD	00		
0344	1146	TAD	00	0345	1146	TAD	00		
0345	1146	TAD	00	0346	1146	TAD	00		
0346	1146	TAD	00	0347	1146	TAD	00		
0347	1146	TAD	00	0348	1146	TAD	00		
0348	1146	TAD	00	0349	1146	TAD	00		
0349	1146	TAD	00	0350	1146	TAD	00		
0350	1146	TAD	00	0351	1146	TAD	00		
0351	1146	TAD	00	0352	1146	TAD	00		
0352	1146	TAD	00	0353	1146	TAD	00		
0353	1146	TAD	00	0354	1146	TAD	00		
0354	1146	TAD	00	0355	1146	TAD	00		
0355	1146	TAD	00	0356	1146	TAD	00		
0356	1146	TAD	00	0357	1146	TAD	00		
0357	1146	TAD	00	0358	1146	TAD	00		
0358	1146	TAD	00	0359	1146	TAD	00		
0359	1146	TAD	00	0360	1146	TAD	00		
0360	1146	TAD	00	0361	1146	TAD	00		
0361	1146	TAD	00	0362	1146	TAD	00		
0362	1146	TAD	00	0363	1146	TAD	00		
0363	1146	TAD	00	0364	1146	TAD	00		
0364	1146	TAD	00	0365	1146	TAD	00		
0365	1146	TAD	00	0366	1146	TAD	00		
0366	1146	TAD	00	0367	1146	TAD	00		
0367	1146	TAD	00	0368	1146	TAD	00		
0368	1146	TAD	00	0369	1146	TAD	00		
0369	1146	TAD	00	0370	1146	TAD	00		
0370	1146	TAD	00	0371	1146	TAD	00		
0371	1146	TAD	00	0372	1146	TAD	00		
0372	1146	TAD	00	0373	1146	TAD	00		
0373	1146	TAD	00	0374	1146	TAD	00		
0374	1146	TAD	00	0375	1146	TAD	00		
0375	1146	TAD	00	0376	1146	TAD	00		
0376	1146	TAD	00	0377	1146	TAD	00		
0377	1146	TAD	00	0378	1146	TAD	00		
0378	1146	TAD	00	0379	1146	TAD	00		
0379	1146	TAD	00	0380	1146	TAD	00		
0380	1146	TAD	00	0381	1146	TAD	00		
0381	1146	TAD	00	0382	1146	TAD	00		
0382	1146	TAD	00	0383	1146	TAD	00		
0383	1146	TAD	00	0384	1146	TAD	00		
0384	1146	TAD	00	0385	1146	TAD	00		
0385	1146	TAD	00	0386	1146	TAD	00		
0386	1146	TAD	00	0387	1146	TAD	00		
0387	1146	TAD	00	0388	1146	TAD	00		
0388	1146	TAD	00	0389	1146	TAD	00		
0389	1146	TAD	00	0390	1146	TAD	00		
0390	1146	TAD	00	0391	1146	TAD	00		
0391	1146	TAD	00	0392	1146	TAD	00		
0392	1146	TAD	00	0393	1146	TAD	00		
0393	1146	TAD	00	0394	1146	TAD	00		
0394	1146	TAD	00	0395	1146	TAD	00		
0395	1146	TAD	00	0396	1146	TAD	00		
0396	1146	TAD	00	0397	1146	TAD	00		
0397	1146	TAD	00	0398	1146	TAD	00		
0398	1146	TAD	00	0399	1146	TAD	00		
0399	1146	TAD	00	0400	1146	TAD	00		
0400	1146	TAD	00	0401	1146	TAD	00		
0401	1146	TAD	00	0402	1146	TAD	00		
0402	1146	TAD	00	0403	1146	TAD	00		
0403	1146	TAD	00	0404	1146	TAD	00		
0404	1146	TAD	00	0405	1146	TAD	00		
0405	1146	TAD	00	0406	1146	TAD	00		
0406	1146	TAD	00	0407	1146	TAD	00		
0407	1146	TAD	00	0408	1146	TAD	00		
0408	1146	TAD	00	0409	1146	TAD	00		
0409	1146</								

/LMODE
/CAN THE DATA FIELD REGISTER BE LOADED WITH RANDOM NUMBERS

0315	4544	JMS 1	RANDOM	/GET RANDOM NUMBER
0316	0114	AND	LMASK	/SAVE BITS 07-11
0317	3146	DCA	REG8	/SAVE FOR OBSERVATION
0320	1146	TAD	REG8	/FETCH IT
0321	1104	TAD	KLDF	/ADD LF
0322	3324	DCA	+2	/PLACE IN ROUTINE
0323	6141	LINC		/GO TO LINC MODE
0324	0000	0000		/EXECUTE LDF
0325	0500	IOB		/PREPARE TO GET DATA FIELD
0326	6214	RDF		/GET DATA FIELD
0327	0002	PDP		/BACK TO PMODE
0330	7110	RAR CLL		/JUSTIFY RIGHT TO AGREE WITH REG8
0331	3147	DCA	REGC	/SAVE FOR TYPING
0332	1147	TAD	REGC	/FETCH IT
0333	7041	CIA		/2'S COMPLEMENT
0334	1146	TAD	REG8	/COMPARE
0335	6201	CDF	00	/RESTORE DATA FIELD
0336	7650	SNA CLA		/INCORRECT IF NOT ZERO
0337	4516	JMS 1	NERROR	/CHECK WITH MONITOR
0340	4471	JMS 1	ERROR	/LDF FAILED
0341	5613	TS104M		/MESSAGE POINTER
0342	7402	HLT		/ERROR HALT
0343	7610	SKP CLA		/GO TO NEXT TEST
0344	0315	TS104		/SCOPE LOOP; ISZ LOOP

/PMODE
/GATE SHAKER TEST

0515	4544	TST05, JMS I	RANDOM
0346	0121	AND	PMASK
0347	3146	DCA	REGC
0350	1146	TAD	REGC
0351	1101	TAD	KCDF
0352	3374	DCA	NOM1
0353	6201	CDF	00
0354	6241	CDF	40
0355	6221	CDF	20
0356	6211	CDF	10
0357	6271	CDF	70
0360	6261	CDF	60
0361	6251	CDF	50
0362	6241	CDF	40
0363	6231	CDF	30
0364	6221	CDF	20
0365	6211	CDF	10
0366	6221	CDF	20
0367	6231	CDF	30
0370	6241	CDF	40
0371	6251	CDF	50
0372	6261	CDF	60
0373	6271	CDF	70
0374	0000	CDF	00
0375	6214	ROP	PMASK
0376	0121	AND	PMASK
0377	3147	DCA	REGC
0400	1147	TAD	REGC
0401	7041	CIA	00
0402	1146	TAD	REGC
0403	6201	CDF	00
0404	7050	SNA CLA	00
0405	4516	JMS I	NERROR
0406	4471	JMS I	ERROR
0407	5645	TST05M	00
0410	7402	HLT	00
0411	7610	SKP CLA	00
0412	0345	TST05	00

/GET A RANDOM NUMBER
/SAVE BITS 06-08
/SAVE FOR OBSERVATION
/FETCH IT
/ADD CDF
/STORE FOR EXECUTION
/FOLLOWING IS A SERIES OF CDF
/NOISE MAKERS.
/GET DATA FIELD
/SAVE BITS 06-08
/SAVE FOR TYPING
/FETCH IT
/2'S COMPLEMENT
/COMPARE
/RESTORE DATA FIELD
/INCORRECT IF NOT ZERO
/CHECK WITH MONITOR
/PROBLEMS WITH NOISY DATA FIELD
/MESSAGE POINTER
/ERROR HALT
/GO TO NEXT TEST
/SCOPE LOOP; ISZ LOOP

/LMODE
/GATE SHAKER TEST

0413	4544	TST06, JMS I	RANDOM	/GET A RANDOM NUMBER
0414	0114	AND	LMASK	/SAVE BITS 07-11
0415	3146	DCA	REG8	/SAVE FOR OBSERVATION
0416	1146	TAD	REG8	/FETCH IT
0417	1104	TAD	KLDF	/ADD LDF
0420	3252	DCA	NOM2	/STORE FOR EXECUTION
0421	6141	LINC		/GO TO LINC MODE
0422	0640	LDF		/TRY SOME DATA FIELD
0423	0677	LDF		/NOISEMAKERS
0424	0660	LDF		
0425	0650	LDF		
0426	0644	LDF		
0427	0642	LDF		
0430	0641	LDF		
0431	0665	LDF		
0432	0652	LDF		
0433	0647	LDF		
0434	0670	LDF		
0435	0640	LDF		
0436	0641	LDF		
0437	0642	LDF		
0440	0643	LDF		
0441	0644	LDF		
0442	0645	LDF		
0443	0646	LDF		
0444	0646	LDF		
0445	0647	LDF		
0446	0650	LDF		
0447	0657	LDF		
0450	0667	LDF		
0451	0677	LDF		
0452	0000			/EXECUTE ACTUAL LDF
0453	0500	IOB		/PREPARE TO GET DATA FIELD
0454	6214	RDF		/GET DATA FIELD
0455	0002	PDP		/GO TO PMODE
0456	7110	RAR CL		/JUSTIFY WITH REG8
0457	3147	DCA	REGC	/SAVE FOR TYPING
0460	1147	TAD	REGC	/FETCH IT
0461	7041	CIA		/2'S COMPLEMENT
0462	1146	TAD	REG8	/COMPARE
0463	6201	CDF	00	/RESTORE DATA FIELD
0464	7050	SNA CLA		/INCORRECT IF NOT ZERO
0465	4516	JMS I	NERROR	/CHECK WITH MONITOR
0466	4471	JMS I	ERROR	/PROBLEMS WITH NOISY DATA FIELD
0467	5677	TST06M		/MESSAGE POINTER
0470	7402	HLT		/ERROR HALT
0471	7610	SKP CLA		/GO TO NEXT TEST
0472	0413	TST06		/SCOPE LOOP; ISZ LOOP

/THE DATA FIELD IS NOW CONSIDERED TO BE TESTED.

/NOW CHECK RIB
/CHECK INTERRUPT FACILITY.
/PMODE

0473	6041	TSF	TS107,	
0474	4556	JMS I		/CHECK FOR FLAG
0475	1122	PNTA		/NOT UP; GO SET IT
0476	3155	DCA		/GET ADDRESS RETURN
0477	3142	DCA		/STORE IT
0500	6001	ION		/ZERO THE PMODE SWITCH
0501	7000	NOP		/ENABLE INTERRUPT
0502	6002	IOF		/WAIT
0503	7430	SZL		/DISABLE INTERRUPT
0504	4516	JMS I		/CHECK LINK; INCORRECT IF ZERO
0505	4471	JMS I		/INTERRUPT FAILED
0506	5731	TS107M		/MESSAGE POINTER
0507	7402	HLT		/ERROR HALT
0510	7610	SKP CLA		/GO TO NEXT TEST
0511	0473	TS107		/SCOPE LOOP; ISZ LOOP

0512	6041	TSF	TS108,	
0513	4556	JMS I		/CHECK FOR FLAG
0514	1123	TAD		/NOT UP; GO SET IT
0515	3155	DCA		/STORE IT
0516	4544	JMS I		/GET RANDOM NUMBER
0517	0121	AND		/SAVE BITS 06-08
0520	3146	DCA		/SAVE FOR OBSERVATION
0521	1146	TAD		/FETCH IT
0522	1101	TAD		/ADD CDF
0523	3324	DCA		/STORE FOR EXECUTION
0524	0000	0000		/EXECUTE CDF
0525	6001	ION		/ENABLE INTERRUPT
0526	7000	NOP		/WAIT
0527	6002	IOF		/DISABLE INTERRUPT
0530	6234	RIB		/READ INTERRUPT BUFFER
0531	7006	RTL		/JUSTIFY WITH REG8
0532	7104	RAL		/SOME MORE
0533	0121	AND		/SAVE BITS 06-08
0534	3147	DCA		/SAVE FOR TYPING
0535	1147	TAD		/FETCH IT
0536	7041	CIA		/ZIS COMPLEMENT
0537	1146	TAD		/COMPARE
0540	6201	CDF		/RESTORE DATA FIELD
0541	7650	SNA CLA		/INCORRECT IF NOT ZERO
0542	4516	JMS I		/CHECK WITH MONITOR
0543	4471	JMS I		/LOAD SF OR RIB FAILED
0544	5752	TS108M		/MESSAGE POINTER
0545	7402	HLT		/ERROR HALT
0546	7610	SKP CLA		/GO TO NEXT TEST
0547	0512	TS108		/SCOPE LOOP; ISZ LOOP

/LMODE
/CHECK INTERRUPT FACILITY

0550	6041	TSF	TS19A,	TSF	TS19A
0551	4556	JMS I	SETFLG	JMS I	SETFLG
0552	1125	TAD	PNICA	TAD	PNICA
0553	0036	AND	K1777	AND	K1777
0554	1112	TAD	KLJMP	TAD	KLJMP
0555	3050	DCA	LSET	DCA	LSET
0556	3065	DCA	LPOINT	DCA	LPOINT
0557	7120	CLL CML			
0560	6141	LINC			
0561	0500	IOB			
0562	6001	ION			
0563	0016	LNOP			
0564	0500	IOB			
0565	6002	IOF			
0566	0002	PDP			
0567	7420	SNL			
0570	4516	JMS I	NEOROR	JMS I	NEOROR
0571	4471	JMS I	ERROR	JMS I	ERROR
0572	6004	TS19AM			
0573	7402	HLT			
0574	7610	SKP CLA			
0575	0550	TS19A			

/CHECK FOR FLAG
/NOT UP! GO SET IT
/GET RETURN ADDRESS
/10 BIT ADDRESS
/ADD LINC JUMP
/STORE FOR EXECUTION
/ZERO THE LMODE SWITCH
/SET LINK
/GO TO LINC MODE
/PREPARE TO EXECUTE IOF
/ENABLE INTERRUPTS
/WAIT
/PREPARE TO EXECUTE IOF
/DISABLE INTERRUPTS
/BACK TO PMODE
/CHECK LINK, INCORRECT IF SET
/CHECK WITH MONITOR
/INTERRUPT FAILED
/MESSAGE POINTER
/ERROR HALT
/GO TO NEXT TEST
/ISZ LOOP! SCOPE LOOP

/LMODE			
/CHECK RIB			
TSF	TSF	6041	0576
JMS I	SETFLG	4556	0577
TAD	PNTC	1124	0600
AND	K1777	0036	0601
TAD	KLJMP	1112	0602
DCA	LSET	3050	0603
JMS I	RANDOM	4544	0604
AND	LMASK	0114	0605
DCA	REG8	3146	0606
TAD	REG8	1146	0607
TAD	KLDF	1104	0610
DCA	CLL CML	3214	0611
CLL CML	LINC	6141	0613
0000	IOB	0000	0614
IOB	IOB	0500	0615
ION	LNOP	6001	0616
IONP	WAIT	0016	0617
IOB	IOB	0500	0620
IOF	IOB	6002	0621
IOB	IOB	0500	0622
RIB	RIB	6234	0623
ROL	PDP	0242	0624
2	AND	0002	0625
LMSK	DCA	0114	0626
REGC	REGC	3147	0627
REGC	TAD	1147	0630
CIA	TAD	7041	0631
TAB	TAD	1146	0632
00	CDF	6201	0633
SNA CLA	JMS I	4516	0634
JMS I	JMS I	4516	0635
ERROR	JMS I	4516	0636
TS109M	HLT	7402	0640
TS109	SKP CLA	7610	0641
		0576	0642

/CHECK FOR FLAG

/NOT UP, GO SET IT

/GET RETURN ADDRESS

/10 BIT ADDRESS

/ADD LINC JUMP

/STORE IN RETURN ADDRESS

/GET RANDOM NUMBER

/SAVE BITS 07-11

/SAVE FOR COMPARISON

/FETCH IT

/ADD LDF

/STORE FOR EXECUTION

/SET LINK

/GO TO LINC MODE

/EXECUTE LDF

/PREPARE FOR IOT

/PREPARE FOR IOT

/ENABLE INTERRUPT

/WAIT

/PREPARE FOR IOT

/DISABLE INTERRUPT

/PREPARE FOR IOT

/JUSTIFY WITH REG8

/BACK TO PMODE

/SAVE BITS 07-11

/SAVE FOR TYPING

/FETCH IT

/2'S COMPLEMENT

/COMPARE

/RESTORE DATA FIELD

/INCORRECT IF NOT ZERO

/CHECK WITH MONITOR

/LMODE RIB FAILED

/MESSAGE POINTER

/ERROR HALT

/GO TO NEXT TEST

/SCOPE LOOP: ISZ LOOP

/PMODE
/DOES THE DATA FIELD SET TO ZERO FOR AN INTERRUPT

0643	TS10, TSF	/CHECK FLAG
0644	JMS I	/NO UP1 GO SET IT
0645	TAD	/GET RETURN ADDRESS
0646	PNTD	/STORE IT
0647	DCA	/GET RANDOM NUMBER
0650	JMS I	/SAVE BITS 06-08
0651	AND	/SAVE FOR TYPING
0652	DCA	/FETCH IT
0653	TAD	/ADD CDF
0654	TAD	/STORE FOR EXECUTION
0655	DCA	/EXECUTE CDF
0656	ION	/ENABLE INTERRUPT
0657	NOP	/HAIT
0660	IOF	/DISABLE INTERRUPT
0661	RIB	/GET INTERRUPT BUFFER
0662	RTL	/JUSTIFY WITH REGS
0663	RAI	/SOME MORE
0664	DCA	/SAVE FOR TYPING
0665	RDF	/READ DATA FIELD
0666	AND	/SAVE BITS 06-08
0667	DCA	/STORE FOR TYPING
0670	TAD	/FETCH IT
0671	CDF	/RESTORE DATA FIELD
0672	SNA CLA	/INCORRECT IF NOT ZERO
0673	JMS I	/CHECK WITH MONITOR
0674	JMS I	/DATA FIELD FAILED TO ZERO
0675	TS10M	/MESSAGE POINTER
0676	HLT	/ERROR HALT
0677	SKP CLA	/GO TO NEXT TEST
0700	TS10	/SCOPE LOOP1 ISZ LOOP

/LMODE
/DOES THE DATA FIELD SET TO ZERO FOR AN INTERRUPT

6041	TSF	JMS I	SETFLG	/CHECK FLAG
0701	TS111,			
4556				/NOT UP! GO SET IT
0703		TAD	PNTC	/GET RETURN ADDRESS
0704		AND	K1777	/10 BIT ADDRESS
0705		TAD	KLJMP	/ADD LINC MODE JMP
0706		DCA	LSET	/STORE IT
0707		JMS I	RANDOM	/GET RANDOM NUMBER
0710		AND	LMASK	/SAVE BITS 07-11
0711		DCA	REGB	/STORE FOR TYPING
0712		TAD	REGB	/FETCH IT
0713		TAD	KLDF	/ADD LDF
0714		DCA	+2	/STORE FOR EXECUTION
0715		LINC		/GO TO LINC MODE
0716		0000		/EXECUTE LDF
0717		IOB		/PREPARE FOR IOT
0720		ION		/ENABLE INTERRUPT
0721		LNOP		/WAIT
0722		IOB		/PREPARE FOR IOT
0723		IOF		/DISABLE INTERRUPT
0724		IOB		/PREPARE FOR IOT
0725		RIB		/READ INTERRUPT BUFFER
0726		ROL	2	/JUSTIFY WITH REGB
0727		STC	REGC	/SAVE FOR TYPING
0730		IOB		/PREPARE FOR IOT
0731		RDF		/READ DATA FIELD
0732		PDP		/BACK TO PMODE
0733		RAR	CLL	/JUSTIFY WITH REGB
0734		DCA	REGD	/SAVE FOR TYPING
0735		TAD	REGD	/FETCH IT
0736		CDF	00	/RESTORE DATA FIELD
0737		SNA	CLA	/INCORRECT IF NOT ZERO
4516		JMS I	ERROR	/CHECK WITH MONITOR
0741		JMS I	ERROR	/DATA FIELD FAILED TO ZERO ON INTERRUPT
0742		TS11M		/MESSAGE POINTER
0743		HLT		/ERROR HALT
0744		SKP	CLA	/GO TO NEXT TEST
0745		TS111		/SCOPE LOOP! ISZ LOOP

LOC.


```

/PMODE
/DOES DCA I--TAD I WORK FOR ALL DATA FIELDS
/
0746 7308 TST12, CLA CL
0747 JMS I GETBNK
0750 SNA
0751 JMP I TST13N
0752 DCA REGB
0753 TAD K0020
0754 DCA REGA
0755 TAD REGB
0756 RTL
0757 RAL
0760 TAD KCDF
0761 DCA EXC12
0762 TAD K5252
0763 0000 DCA I
0764 REGA
0765 TAD I
0766 DCA REGA
0767 CDF 00
0768 DCA REGC
0770 TAD REGC
0771 CIA
0772 TAD K5252
0773 CDF 00
0774 SNA CLA
0775 JMS I NERROR
0776 JMS I ERROR
0777 TST12M
0778 HLT
0779 SKP CLA
0780 TST12A
0781 JMP I TST12N
0782 5561

0746 7308 TST12, CLA CL
0747 JMS I GETBNK
0750 SNA
0751 JMP I TST13N
0752 DCA REGB
0753 TAD K0020
0754 DCA REGA
0755 TAD REGB
0756 RTL
0757 RAL
0760 TAD KCDF
0761 DCA EXC12
0762 TAD K5252
0763 0000 DCA I
0764 REGA
0765 TAD I
0766 DCA REGA
0767 CDF 00
0768 DCA REGC
0770 TAD REGC
0771 CIA
0772 TAD K5252
0773 CDF 00
0774 SNA CLA
0775 JMS I NERROR
0776 JMS I ERROR
0777 TST12M
0778 HLT
0779 SKP CLA
0780 TST12A
0781 JMP I TST12N
0782 5561

/CLEAR AC
/GET NEXT BANK
/DONE?
/YES, NEXT TEST VIA PAGE 0
/SAVE BANK
/GET CONSTANT
/SET REGA = 20
/GET CURRENT BANK
/JUSTIFY
/JUSTIFY
/GET CDF
/STORE FOR EXECUTION
/GET CONSTANT
/EXECUTE CDF
/STORE IN TEST BANK
/GET I
/RESTORE DATA FIELD
/SAVE DATA
/FETCH I
/2IS COMPLEMENT
/COMPARE
/RESTORE DATA FIELD
/INCORRECT IF NOT ZERO
/CHECK WITH MONITOR
/DCA I OR TAD I FAILED
/MESSAGE POINTER
/ERROR HALT
/TO NEXT BANK
/SCOPE LOOP: ISZ LOOP
/NEXT BANK VIA PAGE 0

```

/LMODE
/DOES STA-LDA WORK FOR ALL DATA FIELDS

1004	7300	TS113, CLA CL	JMS I	GETBNL	/CLEAR AC
1005	4475				/FIND NEXT BANK
1006	7450				/DONE
1007	5244		JMP	TS114	/YES, GO TO NEXT TEST
1010	3146		DCA	REG8	/SAVE BANK
1011	1077		TAD	K0020	/GET CONSTANT
1012	3145		DCA	REGA	/SET REGA TO 0020
1013	1146		TAD	REG8	/GET CURRENT BANK
1014	1104		TAD	KLDF	/ADD LDF
1015	3222		DCA	EXC13	/STORE FOR EXECUTION
1017	3013	TS13A,	TAD	REGA	/GET ADDRESS
1018	1145		DCA	REG1	/STORE FOR INDIRECT ACCESS
1020	1076		TAD	K5252	/GET CONSTANT
1021	6141		LINO		/GO TO LMODE
1022	0000	EXC13,			/EXECUTE LDF
1023	1053		STA	REG1	/STORE INDIRECT TO DF
1024	1013		LDA		/FETCH NUMBER
1025	0640		LDF		/RESTORE DATA FIELD
1026	0002		PDP		/TO PMODE
1027	3147		DCA	REGC	/SAVE FOR TYPING
1030	1147		TAD	REGC	/FETCH IT
1031	7041		CIA		/2'S COMPLEMENT
1032	1076		TAD	K5252	/COMPARE
1033	6201		CDF	00	/RESTORE DATA FIELD
1034	7650		SNA CLA		/INCORRECT IF NOT ZERO
1035	4516		JMS I	ERROR	/CHECK WITH MONITOR
1036	4471		JMS I	ERROR	/STA OR LDA FAILED
1037	6225		TS13M		/MESSAGE POINTER
1040	7402		HLT		/ERROR HALT
1041	7610		SKP CLA		/NEXT TEST
1042	1016		TS13A		/SCOPE LOOP! ISZ LOOP
1043	5204		JMP	TS113	/NEXT BANK

/TEST THE OUR FUNCTION FOR ALL COMBINATIONS

/LMODE

/DOES OUR NOT FUNCTION WHEN NOT SET?

TS114: CLA CLL

TAD K5252

DCA 0

LINC

LJMP .+1

PDP

TAD 0

CIA

TAD K5252

SEA CLA

JMS I ERROR

JMS I ERROR

TS114M

HLT

SKP CLA

TS114

/CLEAR AC

/GET CONSTANT

/SET 0

/GO TO LINC MODE

/DO A LINC JUMP

/BACK TO P MODE

/GET 0

/2'S COMPLEMENT

/ADD CONSTANT

/HAS LOCATION 0 CHANGED?

/YES! CHECK WITH MONITOR

/LINC JUMP SAVE RETURN FAILED

/MESSAGE POINTER

/ERROR HALT

/TO NEXT TEST

/SCOPE LOOP; ISZ LOOP

1044 7300
1045 1076
1046 3000
1047 6141
1050 7051
1051 0002
1052 1000
1053 7041
1054 1076
1055 7040
1056 4516
1057 4471
1060 6261
1061 7402
1062 7610
1063 1044

TS113: CLA CLL

TAD K5252

DCA 0

LINC

LJMP .+1

PDP

TAD 0

CIA

TAD K5252

SNA CLA

JMS I ERROR

JMS I ERROR

TS113M

HLT

SKP CLA

TS113

/CLEAR AC
/GET CONSTANT
/SET 0
/TO L MODE
/DISABLE JUMP SAVE RETURN
/DO A LINC JUMP
/BACK TO P MODE
/GET 0
/2'S COMPLEMENT
/COMPARE WITH CONSTANT
/DID OUR WORK?
/CHECK WITH MONITOR
/OUR FAILED
/MESSAGE POINTER
/ERROR HALT
/TO NEXT TEST
/SCOPE LOOP; ISZ LOOP

1064 7300
1065 1076
1066 3000
1067 6141
1070 0006
1071 7072
1072 0002
1073 1000
1074 7041
1075 1076
1076 7050
1077 4516
1100 4471
1101 6016
1102 7402
1103 7610
1104 1064

/LMODE
/DOES A LINC JUMP CLEAR DJR?

1105	7300	CLA CLL	TS116,	/CLEAR AC
1106	1076	TAD	K5252	/GET CONSTANT
1107	3000	DCA	0	/SET 0
1110	6141	LINC		/TO LMODE
1111	0006	DJR		/DISABLE JUMP SAVE RETURN
1112	7113	LJMP	+1	/DO A LINC JUMP
1113	7114	LJMP	+1	/DO ANOTHER LINC JUMP
1114	0002	PDP		/BACK TO PMODE
1115	1000	TAD	0	/GET 0
1116	7041	CIA		/2'S COMPLEMENT
1117	1076	TAD	K5252	/COMPARE WITH CONSTANT
1120	7040	SEA CLA		/DID DJR CLEAR?
1121	4516	JMS I	NERROR	/CHECK MONITOR
1122	4471	JMS I	NERROR	/DJR FAILED TO CLEAR
1123	6344	TS116M		/MESSAGE POINTER
1124	7402	HLT		/ERROR HALT
1125	7610	SKP CLA	TS116	/TO NEXT TEST
1126	1105			/SCOPE LOOP; 192 LOOP

/PMODE
/DOES JUMP SAVE RETURN WORK FOR 8 MODE JUMPS?

1127	7300	CLA CLL	TS117,	/CLEAR AC
1130	1076	TAD	K5252	/GET CONSTANT
1131	3000	DCA	0	/SET 0
1132	5333	JMP	+1	/DO AN 8 MODE JUMP
1133	1000	TAD	0	/GET 0
1134	7041	CIA		/2'S COMPLEMENT
1135	1076	TAD	K5252	/COMPARE WITH CONSTANT
1136	7650	SNA CLA		/DID HE SAVE IN ERROR?
1137	4516	JMS I	NERROR	/CHECK MONITOR
1140	4471	JMS I	NERROR	/JUMP SAVE RETURN OPERATED IN ERROR
1141	6374	TS117M		/MESSAGE POINTER
1142	7402	HLT		/ERROR HALT
1143	7610	SKP CLA	TS117	/TO NEXT TEST
1144	1127			/192 LOOP; SCOPE LOOP

/PMODE
/DOES JUMP SAVE RETURN WORK FOR NON-JUMP COMMANDS?

1145	7300	CLA CL	TS118,		/CLEAR AC
1146	1076	TAD	K5252		/GET CONSTANT
1147	3000	DCA	0		/SET 0
1150	6002	IOF			/IOF LOOKS LIKE LING JUMP
1151	1000	TAD	0		/GET 0
1152	7041	CIA			/2'S COMPLEMENT
1153	1076	TAD	K5252		/COMPARE WITH CONSTANT
1154	7650	SNA CLA			/DID CELL 0 CHANGE?
1155	4516	JMS I	NEROR		/CHECK MONITOR
1156	4471	JMS I	ERROR		/IOF CHANGED CELL 0
1157	6415	TS118M			/MESSAGE POINTER
1160	7402	HLT			/ERROR HALT
1161	7610	SKP CLA	TS118		/TO NEXT TEST
1162	1145				/SCOPE LOOP! ISZ LOOP

/LMODE
/DOES JUMP SAVE RETURN WORK FOR NON-JUMP COMMANDS?

1163	7300	CLA CL	TS119,		/CLEAR AC
1164	1076	TAD	K5252		/GET CONSTANT
1165	3000	DCA	0		/SET 0
1166	6141	LINC			/GO TO LMODE
1167	0500	IOB			/PREPARE FOR IOI
1170	6002	IOF			/DISABLE INTERRUPTS
1171	0002	PDP			/BACK TO PMODE
1172	1000	TAD	0		/FETCH 0
1173	7041	CIA			/2'S COMPLEMENT
1174	1076	TAD	K5252		/ADD CONSTANT
1175	7650	SNA CLA			/EQUAL?
1176	4516	JMS I	NEROR		/CHECK MONITOR
1177	4471	JMS I	ERROR		/IOB/IOF CAUSED LOC 0000 TO ALTER
1200	6441	TS119M			/MESSAGE POINTER
1201	7402	HLT			/ERROR HALT
1202	7610	SKP CLA	TS119		/TO NEXT TEST
1203	1163				/ISZ LOOP! SCOPE LOOP

/LMODE
 /DOES OUR CLEAR WITH 8 MODE JUMP?

1204	7300	TS120, CLA CLL	TS120	/CLEAR AC
1205	1076	TAD K5252		/GET CONSTANT
1206	3000	DCA 0		/SET 0
1207	6141	LINC		/TO LMODE
1210	0006	DJR		/DISABLE JUMP RETURN SAVE
1211	0002	PDP		/TO PMODE
1212	5213	JMP	*,+1	/JUMP
1213	6141	LINC		/TO LMODE
1214	7215	LUMP	*,+1	/JUMP
1215	0002	PDP		/TO PMODE
1216	1000	TAD 0		/FETCH 0
1217	7041	CIA		/2'S COMPLEMENT
1220	1076	TAD K5252		/ADD CONSTANT
1221	7650	SNA CLA		/EQUAL?
1222	4916	JMS I NERROR		/CHECK MONITOR
1223	4471	JMS I ERROR		/8 MODE JUMP CLEARED DJR
1224	6465	TS120H		/MESSAGE POINTER
1225	7402	HLT		/ERROR HALT
1226	7610	SKP CLA		/TO NEXT TEST
1227	1204	TS120		/ISE LOOP! SCOPE LOOP

```
/PROMODE
/DOES DJR INHIBIT 8 MODE INTERRUPT SAVE?
/
12300 7300 TS121, CLA CLL
12301 1130 PNTF
12302 3155 DCA RETURN
12303 1076 TAB K5252
12304 3000 DCA 0
12305 6041 TSF
12306 4556 JMS I SETFLG
12307 6141 LINC
12400 0006 DJR
12401 0002 PDP
12402 6001 ION
12403 7000 NOP
12404 6002 IOF
12405 7410 SKP
12406 1000 TAB 0
12407 7041 CIA
12408 1076 TAB K5252
12409 7640 SEA CLA
12410 4516 JMS I NEROR
12411 4471 JMS I ERROR
12412 6506 TS121M
12413 7402 HLT
12414 7610 SKP CLA
12415 1230 TS121
12416 7340 CLA CLL CMA
12417 3145 DCA REGA
12500 7300 /CLEAR AC
12501 /GET RETURN POINTER TO LOOP
12502 /SET UP INTERRUPT HANDLER
12503 /GET CONSTANT
12504 /STORE IN 0
12505 /FLAG SET?
12506 /NO, GO SET IT
12507 /TO LMODE
12508 /SET DJR
12509 /TO PROMODE
12510 /ENABLE INTERRUPTS
12511 /WAIT
12512 /DISABLE INTERRUPTS
12513 /IF NO INTERRUPT, THIS CAUSES ERROR
12514 /GET 0
12515 /2IS COMPLEMENT
12516 /ADD CONSTANT
12517 /EQUAL?
12518 /CHECK MONITOR
12519 /DJR INHIBITED 8 MODE INTERRUPT
12520 /MESSAGE POINTER
12521 /ERROR HALT
12522 /TO NEXT TEST
12523 /ISZ LOOP1 SCOPE LOOP
12524 /SET AC=7777
12525 /PRESSET REGA FOR NEXT TEST
```

/PMODE
/WILL NON-EXISTANT MEMORY DETECT WORK FOR ALL BANKS?

1252	7300	TS122, CLA CLL	/CLEAR AC
1253	1066	TAD BANK	/GET AVAILABLE MEMORY
1264	3151	DCA REGD	/SAVE IT
1265	1151	TAD REGD	/FETCH IT
1266	7041	CIA	/2'S COMPLEMENT
1270	1022	TAD K0007	/ADD MAXIMUM MEMORY
1271	1146	TAD REG8	/SAVE IT
1272	7450	SNA	/FETCH IT
1273	5370	JMP TS123	/HOW MUCH WAS LEFT?
1274	7010	RAR	/CHECK BIT 11
1275	7620	SNL CLA	/IS MEMORY ODD OR EVEN?
1276	5342	JMP	/NEXT BANK IS EVEN
1277	5316	JMP	/NEXT BANK IS ODD
1300	7300	CLA CLL	/CLEAR AC
1301	6201	CDF 00	/RESTORE DATA FIELD
1302	1151	TAD REGD	/GET LAST BANK TESTED
1303	7041	CIA	/2'S COMPLEMENT
1304	1022	TAD K0007	/COMPARE WITH MAXIMUM
1305	7640	SEA CLA	/DONE?
1306	5342	JMP	/NO, TEST NEXT BANK
1307	4516	JMS I	/CHECK MONITOR
1310	4471	JMS I	/NON-EXIST DETECT FAILED
1311	6535	TS122M	/MESSAGE POINTER
1312	7402	HLT	/ERROR HALT
1313	7410	SKP	/TO NEXT TEST
1314	1262	TS122	/ISZ LOOP! SCOPE LOOP
1315	5370	JMP	/JUMP OVER READ ROUTINES

/PMODE
/READ 0 ROUTINE FOR 15122 (USED ONLY ONCE PER PASS)

1316	7300	CLA CLL	READ0,		/CLEAR AC
1317	2151	ISZ	REGD	REGD	/INCREMENT NON-EXIST BANK
1320	1151	TAD	REGD		/FETCH BANK NUMBER
1321	7006	RTL			/JUSTIFY
1322	7004	RAL			/JUSTIFY
1323	1101	TAD	KCDF		/FETCH CDF 00
1324	3325	DCA		+1	/STORE FOR EXECUTION
1325	0000	CMA		0000	/EXECUTE CDF
1326	7040	CMA			/SET AC=7777
1327	3015	DCA	AUT011		/SETUP POINTER REGISTER
1330	3000	DCA		0	/SETUP COUNTER
1331	1415	TAD	1	AUT011	/FETCH NON-EXISTANT WORD
1332	7440	SZA			/ZERO?
1333	5337	JMP		+4	/NO, ENTER ERROR ROUTINE
1334	2000	ISZ		0	/INCREMENT COUNTER
1335	5331	JMP		-4	/TRY NEXT LOCATION
1336	5300	JMP		BAK22	/BANK FINISHED! RETURN
1337	6201	CDF		00	/RESTORE DATA FIELD
1340	3147	DCA		REGC	/SAVE AC FOR TYPEOUT
1341	5310	JMP		FAL22	/TO ERROR MONITOR
1342	7300	CLA CLL	READ1,		/CLEAR AC
1343	2151	ISZ	REGD	REGD	/INCREMENT NON-EXIST BANK
1344	1151	TAD	REGD		/FETCH IT
1345	7006	RTL			/JUSTIFY
1346	7004	RAL			/JUSTIFY
1347	1101	TAD	KCDF		/FETCH CDF 00
1350	3351	DCA		+1	/STORE FOR EXECUTION
1351	0000	CMA		0000	/EXECUTE CDF
1352	7040	CMA			/SET AC=7777
1353	3015	DCA	AUT011		/SETUP POINTER REGISTER
1354	3000	DCA		0	/SETUP COUNTER
1355	1415	TAD	1	AUT011	/FETCH NON-EXISTANT WORD
1356	7040	CMA			/COMPLEMENT
1357	7440	SZA			/ZERO?
1360	5364	JMP		+4	/NO, ENTER ERROR ROUTINE
1361	2000	ISZ		0	/INCREMENT COUNTER
1362	5355	JMP		-5	/TRY NEXT LOCATION
1363	5300	JMP		BAK22	/BANK FINISHED! RETURN
1364	7040	CMA			/RESTORE AC
1365	3147	DCA		REGC	/SAVE FOR TYPEOUT
1366	6201	CDF		00	/RESTORE DATA FIELD
1367	5310	JMP		FAL22	/TO ERROR MONITOR

/PMODE
/NOW SET UP EXTENDED MEMORY FOR FURTHER TESTING

1370	7300	TS123,	CLA CLL	JMS I	GETBNK	/CLEAR AC
1371	4474					/GO FIND NEXT BANK
1372	7450					/DONE?
1373	5564	JMP I	TS124N			/YES, EXIT
1374	3376	DCA	*2			/NO SAVE BANK FOR EXECUTION
1375	4553	JMS I	RELOCN			/GO RELOCATE ALL OF MEMORY
1376	0000					/TARGET BANK
1377	7777					/ORG.
1400	7777					/DEST.
1401	7777					/LENGTH
1402	5563	JMP I	TS123N			/DO IT AGAIN

/TRY A CIF-ION-JMP TO ALL BANKS

1403	7300	CLA CLL	TS124,		
1404	3142	DCA	POINT		
1405	4474	JMS I	GETBNK		
1406	7450	SNA			
1407	5246	JMP	TS125		
1410	7006	RTL			
1411	7004	RAL			
1412	3146	DCA	REG8		
1413	1146	TAD	REG8		
1414	1102	TAD	KCIF		
1415	3222	DCA	5		
1416	1131	TAD	PNTG		
1417	3195	DCA	RETURN		
1420	6041	TSF			
1421	4556	JMS I	SETFLG		
1422	0000	0000			
1423	6001	ION			
1424	5224	JMP			
1425	6002	IOF			
1426	6202	CIF	00		
1427	9555	JMP I	RETURN		
1430	1143	TAD	PRG		
1431	0027	AND	K0070		
1432	3147	DCA	REGC		
1433	1147	TAD	REGC		
1434	7041	CIA			
1435	1146	TAD	REG8		
1436	7650	SNA	CLA		
1437	4516	JMS I	ERROR		
1440	4471	JMS I	ERROR		
1441	6575	TS124M			
1442	7402	HLT			
1443	7410	SKP	TS124+10		
1444	1413	JMP	TS124		
1445	5203				

```

/CLEAR AC
/ZERO THE PHODE SWITCH
/GO GET THE NEXT BANK
/DONE?
/EXIT
/JUSTIFY
/JUSTIFY
/SAVE IT
/FETCH IT
/ADD CIF
/STORE FOR EXECUTION
/GET RETURN ADDRESS
/SET UP HANDLER
/FLAG SET?
/NO, GO SET IT
/EXECUTE CIF
/ENABLE INTERRUPTS
/HAIT
/DISABLE INTERRUPTS
/BACK TO BANK 0
/JUMP DOWN
/GET INTERRUPT SF
/CLEAR OUT ALL BUT 06,07,08
/SAVE IT
/FETCH IT
/ZIS COMPLEMENT
/COMPARE
/EQUAL?
/CHECK MONITOR
/IF FAILED TO LOAD
/MESSAGE POINTER
/ERROR HALT
/TO NEXT TEST
/ISZ LOOP1 SCOPE LOOP
    
```

/LMODE
/TRY A LIF-IOB-ION-NOP TO ALL BANKS

1446	7300	TS125, CLA CLL	/CLEAR AC
1447	3065	DCA LPOINT	/ZERO THE LMODE SWITCH
1450	4474	JMS I GETBNK	/GET NEXT BANK
1451	7450	SNA	/DONE?
1452	5314	JMP	/EXIT
1453	3146	DCA REG8	/SAVE FIELD
1454	1146	TAD REG8	/FETCH IT
1455	7006	RTL	/JUSTIFY
1456	1111	TAD KLIF	/MAKE IT A LIF
1457	3266	DCA *7	/STORE FOR EXECUTION
1460	1132	TAD PNTH	/GET RETURN ADDRESS
1461	1112	TAD KLJMP	/MAKE IT A LINC JUMP
1462	3050	DCA LSET	/STORE FOR RETURN
1463	6041	TSF	/FLAG SET?
1464	4556	JMS I SETFLG	/NO, GO SET IT
1465	6141	LINC	/GO TO LMODE
1466	0000	0000	/EXECUTE LIF
1467	0500	IOB	/ENABLE INTERRUPTS
1470	6001	ION	/WAIT
1471	0016	LNOP	/WAIT
1472	7472	LJMP	/GET SAVE FIELD BUT IF
1473	2064	ADD LREG	/CLEAR OUT ALL BUT IF
1474	1560	BCL	/
1475	6037	6037	/JUSTIFY
1476	0305	ROR	/SAVE IT
1477	4147	STC REGC	/BACK TO PMODE
1500	0002	PDP	/GET TARGET IF
1501	1146	TAD REG8	/2'S COMPLEMENT
1502	7041	CIA	/GET CURRENT IF
1503	1147	TAD REGC	/EQUAL?
1504	7650	SNA CLA	/CHECK MONITOR
1505	4516	JMS I ERROR	/IF FAILED TO LOAD
1506	4471	JMS I ERROR	/MESSAGE POINTER
1507	6631	TS125H	/ERROR HALT
1510	7402	HLT	/TO NEXT TEST
1511	7410	SKP	/ISZ LOOP, SCOPE LOOP
1512	1454	TS125+6	
1513	5246	JMP	
1514	7300	TS125, CLA CLL	

/PMODE
/NOW GO TO EXTENDED MEMORY AND TEST RMF

1514	7300	CLA CLL	JMS I	GETBANK	JMS I	1515
1515	4474				SNA	1516
1517	5565	JMP I	TS127N			1517
1520	7006	RTL				1520
1521	7004	RAL				1521
1522	3146	DCA	REG8			1522
1523	6041	TSF				1523
1524	4556	JMS I	SETFLG			1524
1525	7040	CMA				1525
1526	3142	DCA	POINT			1526
1527	1146	TAD	REG8			1527
1530	1102	TAD	KCIF			1530
1531	3332	DCA		.+1		1531
1532	0000	0000				1532
1533	6001	ION				1533
1534	5334	JMP				1534
1535	6002	IOF				1535
1536	6224	RIF				1536
1537	3550	DCA I	REGCN			1537
1540	6202	CIF		00		1540
1541	5342	JMP		.+1		1541
1542	7300	CLA CLL				1542
1543	1146	TAD	REG8			1543
1544	7041	CIA				1544
1545	1147	TAD	REGC			1545
1546	7650	SNA CLA				1546
1547	4516	JMS I	ERROR			1547
1550	4471	JMS I	TS126M			1550
1551	6664	HLT				1551
1552	7402	SKP	TS126+7			1552
1553	7410	JMP	TS126			1553
1555	5314					1555

/CLEAR AC
 /GET NEXT BANK
 /DONE?
 /YES, NEXT TEST
 /JUSTIFY
 /JUSTIFY
 /SAVE BANK
 /FLAG SET?
 /NO, GO SET IT
 /SET AC=7777
 /SET P SWITCH=1
 /GET BANK
 /MAKE IT A CIF N
 /STORE FOR EXECUTION
 /EXECUTE CIF
 /ENABLE INTERRUPTS
 /GO TO EXTENDED MEMORY AND WAIT
 /DISABLE INTERRUPTS
 /GET INSTRUCTION FIELD
 /SAVE IT
 /BACK TO FIELD 0
 /CHANGE FIELDS
 /GET TARGET FIELD
 /ZIS COMPLEMENT
 /COMPARE WITH ACTUAL FIELD
 /EQUAL?
 /CHECK MONITOR
 /CIF FAILED TO FIND PROPER IF
 /MESSAGE POINTER
 /ERROR HALT
 /TO NEXT TEST
 /ISZ LOOP! SCOPE LOOP
 /DO NEXT BANK

/PMODE
/INTERRUPT INHIBIT TEST BANK 0 - BANK N - BANK 0

1556	7300	CLA CLL	TS127,	/CLEAR AC
1557	1133	TAD	PNTI	/GET RETURN
1560	3155	DCA	RETURN	/SET UP HANDLER
1561	4474	JMS I	GETBNK	/GET NEXT BANK
1562	7450	SNA		/DONE
1563	5566	JMP I	TS128N	/YES, GO TO NEXT TEST
1564	3146	DCA	REG8	/SAVE BANK
1565	1146	TAD	REG8	/FETCH IT
1566	7006	RTL		/JUSTIFY FOR CIF
1567	7004	RAL		/JUSTIFY
1570	1102	TAD	KCIF	/MAKE IT A CIF
1571	3374	DCA		/STORE FOR EXECUTION
1572	6041	TST		/FLAG SET?
1573	4556	JMS I	SETFLG	/NO, GO SET IT
1574	0000			/EXECUTE CIF
1575	7000	NOP		/SPACER
1576	5377	JMP	+1	/GO TO UPPER MEMORY
1577	7000	NOP		/WAIT FOR INTERRUPT
1600	7000	NOP		/WAIT FOR INTERRUPT
1601	6002	IOF		/TO HERE IF NO INTERRUPT
1602	6202	CIF	00	/BACK TO BANK 0
1603	5204	JMP	+1	/JUMP INTO MONITOR
1604	4516	JMS I	NEROR	/INTERRUPT OK! CHECK MONITOR
1605	4471	JMS I	ERROR	/PMODE INTERRUPT INHIBIT FAILED
1606	6721	TS127M		/MESSAGE POINTER
1607	7402	HLT		/ERROR HALT
1610	7410	SKP		/TO NEXT TEST
1565	1565	TS127+7		/ISZ LOOP! SCOPE LOOP
1612	5565	JMP I	TS127N	/DO NEXT BANK

LOC1,

```

/ LMODE
/ INTERRUPT INHIBIT TEST BANK 0 - BANK N= BANK 0
/
1613 7300 TS12B, CLA CLL
1614 3065 DCA
1615 1134 TAD
1616 1112 TAD
1617 3050 DCA LSET
1620 4474 JMS I GETBANK
1621 7450 SNA
1622 5263 JMP TS129
1623 3146 DCA REG8
1624 1146 TAD REG8
1625 7006 RTL
1626 1111 TAD KLIF
1627 3233 DCA
1630 6041 TSF
1631 4556 JMS I SETFLG
1632 6141 LINC
1633 0600 LIF
1634 0500 IOB
1635 6001 IOB
1636 7637 LUMP
1637 0016 LNOP
1640 0600 LIF
1641 0500 IOB
1642 6001 IOB
1643 7644 LUMP
1644 0016 LNOP
1645 0500 IOB
1646 6002 IOB
1647 0002 PDP
1650 5254 JMP
1651 0002 PDP
1652 6002 IOB
1653 7410 SKP
1654 4516 JMS I ERROR
1655 4471 JMS I ERROR
1656 6756 TS128M
1657 7402 HLT
1660 7610 SKP CLA
1661 1624 TS12B+11
1662 5213 JMP TS12B
/ CLEAR AC
/ CLEAR HANDLER SWITCH
/ GET ERROR RETURN
/ MAKE IT A LINC JUMP
/ PLACE IT IN HANDLER
/ GET NEXT 4K BANK
/ DONE?
/ YES, NEXT TEST
/ SAVE BANK
/ FETCH IT
/ JUSTIFY FOR LMODE LIF
/ MAKE IT A LIF N
/ STORE FOR EXECUTION
/ FLAG SET?
/ NO, GO SET IT
/ TO LINC MODE
/ EXECUTE LIF N
/
/ ENABLE INTERRUPTS (SHOULD INHIBIT)
/ TO EXTENDED MEMORY
/ WAIT FOR INTERRUPT
/ LOAD IB
/
/ ENABLE INTERRUPT AGAIN
/ BACK TO BANK 0
/ WAIT FOR INTERRUPT
/
/ DISABLE INTERRUPT
/ BACK TO PMODE
/ TO NON-ERROR
/ BACK HERE IF INTERRUPT OCCURS
/ DISABLE INTERRUPT
/ SKIP INTO ERROR
/ CHECK MONITOR
/ LIF FAILED TO INHIBIT INTERRUPT
/ MESSAGE POINTER
/ ERROR HALT
/ TO NEXT TEST
/ IS2 LOOP1 SCOPE LOOP
/ NEXT BANK

```


/LMODE
/INTERRUPT INHIBIT TEST, DOES JMP 0 CLEAR INT INH?

1605	7300	CLA CLP	TS129,	/CLEAR AC
1604	3065	DCA	LPOINT	/SET L SWITCH TO OFF
1605	1335	TAD	PNTK	/GET RETURN
1606	1112	TAD	KLJMP	/MAKE IT A LINC JUMP
1607	3050	DCA	LSET	/PUT IT IN HANDLER
1608	4474	JMS I	GETBNK	/GET NEXT BANK
1609	7450	SNA		/DONE?
1610	5347	JMP	TS130	/YES, NEXT TEST
1611	3146	DCA	REG8	/SAVE TARGET
1612	1146	TAD	REG8	/FETCH IT
1613	7006	RTL		/JUSTIFY FOR LIF
1614	1111	TAD	KLIF	/MAKE IT A LIF N
1615	3325	DCA	EX29	/STORE FOR EXECUTION
1616	6041	TSP		/FLAG SET?
1617	4556	JMS I	SETFLG	/NO, GO SET IT
1618	3014	DCA	PINT	/SET UP AUTO-INDEX
1619	1146	TAD	REG8	/GET TARGET
1620	7006	RTL		/JUSTIFY FOR CDF
1621	7004	RAI		/JUSTIFY
1622	1101	TAD	KCDF	/MAKE IT A CDF N
1623	3310	DCA		/STORE FOR EXECUTION
1624	0000			/EXECUTE CDF
1625	7020	CML		/SET LINK
1626	1105	TAD	KIOB	/GET IOB
1627	3414	DCA I	PINT	/CELL 0001 BANK N
1628	1106	TAD	KIOF	/GET IOF
1629	3414	DCA I	PINT	/CELL 0002, BANK N
1630	1325	TAD		/GET LIF N
1631	3414	DCA I	PINT	/CELL 0003, BANK N
1632	1050	TAD	LSET	/GET LUMP LOCK
1633	3414	DCA I	PINT	/CELL 0004, BANK N
1634	6201	CDF		/RESTORE DF
1635	1107	TAD	KLNOP	/GET NOP
1636	6141	LINC		/TO L MODE
1637	0000			/EXECUTE LIF
1638	0500	IOB		/TO UPPER MEMORY
1639	6001	ION		/WAIT FOR INTERRUPT
1640	7731	LJMP		/SET UP 0
1641	0016	LNOP		/JMP 0
1642	4000	STC		
1643	6000	LJMP		

EX29,

CLA CLP

JMS I

SETFLG

KCDF

DCA I

TAD

LJMP

STC

LJMP


```
1734 0002 LOCK, PDP
1735 6202 CIF 00
1736 5337 JMP +1
1737 7430 SFL
1740 4516 JMS I ERROR
1741 4471 JMS I ERROR
1742 7013 TS129H
1743 7402 HLT
1744 7410 SKP
1745 1674 TS129+11
1746 5263 JMP TS129

/TO HERE AFTER INTERRUPT OR LOCK
/BACK TO BANK 0 IF NOT THERE
/TO LOWER MEMORY
/SKIP MEANS INTERRUPT NOT INITIALIZED
/CHECK MONITOR
/JMP 0 INT INH IN ERROR
/MESSAGE POINTER
/ERROR HALT
/TO NEXT TEST
/ISZ LOOP1 SCOPE LOOP
/NEXT BANK
```

/LMODE
/WILL DJR-JMP 0 LOAD THE IF?

7340	TS130,	CLA CLL CMA	DCA	LPOINT	1350	7347
1750			DCA		1365	1751
1752			AND	K1777	0036	1752
1753			TAD	KLJMP	1112	1753
1754			DCA	LSET	3050	1754
1755		JMS 1	GETBNK		4474	1755
1756		JMP 1	TS132N		5570	1757
1760		RTL			7006	1760
1761		IAC			7001	1761
1762		DCA			3146	1762
1763	TS130X,	TAD	REG8		1146	1763
1764		TAD	KLIF		1111	1764
1765		DCA 1	PNT30N		3541	1765
1766		TAD	K1777		1036	1766
1767		DCA	PINT		3014	1767
1770		TAD	REG8		1146	1770
1771		RAL			7004	1771
1772		AND	PMASK		0121	1772
1773		TAD	KCDF		1101	1773
1774		DCA	1		3375	1774
1775					0000	1775
1776		TAD	K10B		1105	1776
1777		SKP			7410	1777
2000					0000	2000
2001		DCA 1	PINT		3414	2001
2002		TAD	KRIF		1110	2002
2003		DCA 1	PINT		3414	2003
2004		TAD	LSET		1050	2004
2005		DCA 1	PINT		3414	2005
2006		LINC			6141	2006
2007	PNT30,	DJR			0000	2007
2010					0006	2010
2011		JMP	0		6000	2011

/CLEAR AC
/SMITH=1
/GET RETURN
/CLEAR BITS 0.1
/MAKE IT A LINC JUMP
/PUT IT IN HANDLER (WE WON'T USE INTERRUPTS)
/GET NEXT BANK
/DONE?
/YES, NEXT TEST
/JUSTIFY FOR LIF
/ADD CURRENT IF

/MAKE IT A LIF N
/STORE FOR EXECUTION
/SET AC = 1777 FOR IF 01
/SET UP AUTO-INDEX
/GET TARGET
/JUSTIFY FOR CDF
/JUSTIFY
/MAKE IT A CDF N
/STORE FOR EXECUTION
/EXECUTE CDF N
/IOB
/WASTE A SPACE
/LINC JUMP SAVE
/CELL 2000, BANK N
/RIF LINC MODE (5 BITS)
/CELL 2001, BANK N
/LJMP LOCL
/CELL 2002, BANK N
/TO LMODE
/EXECUTE LIF N
/DISABLE JUMP RETURN SAVE
/JMP 0

2012	0691	LOC, LIF	1	/WE WILL ALWAYS BE IN UPPER MEM
2013	6014	JUMP	1	/BACK TO LOWER MEMORY
2014	0002	PDP		/BACK TO PMODE
2015	7010	RAR		/JUSTIFY
2016	3147	DCA	REGC	/SAVE FIRST RIF
2017	6201	ODF	0	/RESTORE DF
2020	1146	TAD	REGB	/GET TARGET
2021	7041	CIA		/2'S COMPLEMENT
2022	1147	TAD	REGC	/FETCH IF
2023	7650	SNA CLA		/DID WE LOAD THE IF?
2024	4916	JMS I	ERROR	/CHECK MONITOR
2025	4471	JMS I	ERROR	/DJR-JMP 0 FAILED TO LOAD IF
2026	7094	TST30M		/MESSAGE POINTER
2027	7402	HLT		/ERROR HALT
2030	7410	SKP		/TO NEXT TEST
2031	1763	TST30X		/IS2 LOOP/ SCOPE LOOP
2032	5567	JMP I	TST30N	/NEXT BANK

```

/WMODE
/LL ION-LIF INHIBIT INTERRUPTS?
/((TIMING RACE IF EP12-00018 IS NOT INSTALLED)
/SET AC = 7777
/GET NEXT BANK
/GET SWITCH
/GET NEXT BANK
/DONE?
/YES, NEXT TEST
/SAVE BANK
/FETCH IT
/JUSTIFY FOR LIF
/GET CURRENT IF, SET LINK
/MAKE IT A LIF N
/STORE FOR EXECUTION
/TO LMODE
/
/ENABLE INTERRUPTS
/EXECUTE LIF
/WAIT FOR INTERRUPT
/WAIT
/
/DISABLE INTERRUPTS
/TO PMODE
/ERROR?
/CHECK MONITOR
/LIF FAILED TO INHIBIT IN
/MESSAGE POINTER
/ERROR HALT
/TO NEXT TEST
/ISZ LOOP1 SCOPE LOOP
/NEXT BANK

```


/LMODE
/DOES LIF CAUSE THE IF/DF TO TRANSFER TO THE SF?

2072	7300	TS133, CLA CLL	JMS I	GETBNK	TS1334N	/CLEAR AC
2073	4474					/GET NEXT BANK
2074	7450					/DONE?
2075	5572		JMP I			/YES, NEXT TEST
2076	3146		DCA	REGD		/SAVE BANK
2077	6041		TSF			/FLAG SET?
2100	4556		JMS I	SETFLG		/NO, GO SET IT
2101	1146		TAD	REGD		/GET BANK
2102	7006		RTL			/JUSTIFY FOR LIF/LDF
2103	7001		IAC			/GET CURRENT IF
2104	3147		DCA	REGC		/SAVE IT
2105	1147		TAD	REGC		/FETCH IT
2106	7040		CMA			/COMPLEMENT
2107	0114		AND	LMASK		/SAVE DF BITS
2110	3152		DCA	REGC		/SAVE IT
2111	1152		TAD	REGC		/FETCH IT
2112	1104		TAD	KLDF		/MAKE IT A LDF -N
2113	3472		DCA I	EXDF33		/STORE FOR EXECUTION
2114	1147		TAD	REGC		/FETCH CONSTANT
2115	1111		TAD	KLIF		/MAKE IT A LIF N
2116	3473		DCA I	EXIF33		/STORE FOR EXECUTION
2117	6141		LINC			/TO LMODE
2120	0000	XDF33, XIF33,				/EXECUTE LDF
2121	0000					/EXECUTE LIF
2122	6123		LJMP		1	/TO UPPER MEMORY
2123	0601		LIF			/RESTORE IF
2124	0500		IOB			/
2125	6234		RIB			/READ SF
2126	0640		LDF		0	/RESTORE DF
2127	6130		LJMP		2	/BACK TO BANK 0
2130	0242		ROL			/JUSTIFY
2131	0002		PDP			/TO PMODE
2132	3151		DCA	REGD		/SAVE RIB DATA
2133	1147		TAD	REGC		/GET IF
2134	7006		RTL			/JUSTIFY
2135	7006		RTL			/
2136	7004		RAL			/
2137	1152		TAD	REGC		/GET DF
2140	7041		CIA			/2'S COMPLEMENT
2141	1151		TAD	REGD		/ADD RECEIVED
2142	7650		SNA CLA			/EQUAL?
2143	4516		JMS I	ERROR		/CHECK MONITOR
2144	4471		JMS I	ERROR		/LIF FAILED TO LOAD SF
2145	7140		TS133M			/MESSAGE POINTER
2146	7402		HLT			/ERROR HALT
2147	7413		SKP			/TO NEXT TEST
2150	2077		TS133+5			/ISZ LOOP; SCOPE LOOP
2151	5571		JMP I	TS133N		/NEXT BANK

/LMODE
/WILL RMF WORK IN EXTENDED MEMORY?

2152	7300	CLA CLL	TS134,	/CLEAR AC
2153	4474	JMS I	GETBNK	/GET NEXT BANK
2154	7450	SNA		/DONE?
2155	5573	JMP I	TS135N	/YES, NEXT TEST
2156	3146	DCA	REG8	/SAVE TARGET
2157	1146	TAD	REG8	/FETCH IT
2160	7006	RTL		/JUSTIFY FOR LIF
2161	7001	IAC		/INCREMENT FOR FIELD 2
2162	1111	TAD	KLIF	/MAKE IT A LIF N
2163	3366	DCA	+3	/STORE FOR EXECUTION
2164	6002	IOF		/DISABLE INTERRUPTS
2165	6141	LINC		/TO LMODE
2166	0000	0000		/EXECUTE LIF N
2167	6170	JMP	+1	/TO UPPER MEMORY
2170	0500	IOB		/
2171	6244	RMF		/RESTORE MEMORY
2172	0500	IOB		/
2173	6234	RIB		/FIND OUT WHERE WE ARE
2174	6175	JMP	+1	/TO LOWER MEMORY
2175	0002	PDP		/TO PMODE
2176	3550	DCA I	REGCN	/SAVE TARGET - DATA FIELD IS ZERO
2177	6224	RIF		/NOW WHERE ARE WE?
2200	7640	SZA CLA		/RMF FAILED IF NOT ZERO
2201	7040	CMA		/SET AC=7777 TO CAUSE ERROR
2202	6202	CIF	00	/JUST TO BE SURE
2203	5204	JMP	+1	/BACK TO BANK 0
2204	7650	SNA CLA		/AC=7777 IF ERROR
2205	4516	JMS I	NEROR	/CHECK MONITOR
2206	4471	JMS I	ERROR	/RMF FILED
2207	7201	TS134M		/MESSAGE POINTER
2210	7402	HLT		/ERROR HALT
2211	7410	SKP		/TO NEXT TEST
2212	2157	TS134+5		/ISZ LOOP1 SCOPE LOOP
2213	5572	JMP I	TS134N	/NEXT BANK

*2400

/PHODE
/AUTO INDEX TEST (FIRST SET UP REGISTERS)

2400	7302	CLA CLL	TS135.	/CLEAR AC
2401	4474	JMS I	GETBNK	/GET NEXT BANK
2402	7450	SNA		/DONE?
2403	5530	JMP	TS136X	/NEXT TEST
2404	3146	DCA	REG8	/SAVE IT
2405	1146	TAD	REG8	/FETCH IT
2406	7006	RTL		/JUSTIFY
2407	7004	RAL		/JUSTIFY
2410	1102	TAD		/MAKE IT A CIF N
2411	5212	DCA		/STORE FOR EXECUTION
2412	0000			/EXECUTE CIF
2413	1146	TAD		/GET BANK
2414	7006	RTL		/JUSTIFY
2415	7004	RAL		/JUSTIFY
2416	1101	TAD		/MAKE IT A CDF N
2417	3220	DCA		/STORE FOR EXECUTION
2420	0000			/EXECUTE CDF
2421	5222	JMP		/TO UPPER MEMORY
2422	3000	DCA		/CLEAR 0
2423	7040	CMA		/COMPLEMENT AC
2424	3734	DCA I	END	/SET END (END=7777)
2425	7040	CMA		/NOW SET AUTO 10-17 TO 7777
2426	3010	DCA		
2427	7040	CMA		
2430	3011	DCA		
2431	7040	CMA		
2432	3012	DCA		
2433	7040	CMA		
2434	3013	DCA		
2435	7040	CMA		
2436	3014	DCA		
2437	7040	CMA		
2440	3015	DCA		
2441	7040	CMA		
2442	3016	DCA		
2443	7040	CMA		
2444	3017	DCA		

/NOW TEST REGISTERS

/FETCH INDIRECT INDEXING TO 0
/ZERO?
/TO ERROR LOOP.

2415	TAD I	10	SZA CLA	ERR10	JMP	ERR10	ERR10
2446	TAD I	11	TAD I	11	TAD I	11	ERR10
2450	TAD I	12	TAD I	12	TAD I	12	ERR11
2452	TAD I	13	TAD I	13	TAD I	13	ERR12
2453	TAD I	14	TAD I	14	TAD I	14	ERR13
2454	TAD I	15	TAD I	15	TAD I	15	ERR14
2455	TAD I	16	TAD I	16	TAD I	16	ERR15
2456	TAD I	17	TAD I	17	TAD I	17	ERR16
2457	TAD I	18	TAD I	18	TAD I	18	ERR17
2458	TAD I	19	TAD I	19	TAD I	19	ERR18
2459	TAD I	20	TAD I	20	TAD I	20	ERR19
2460	TAD I	21	TAD I	21	TAD I	21	ERR20
2461	TAD I	22	TAD I	22	TAD I	22	ERR21
2462	TAD I	23	TAD I	23	TAD I	23	ERR22
2463	TAD I	24	TAD I	24	TAD I	24	ERR23
2464	TAD I	25	TAD I	25	TAD I	25	ERR24
2465	TAD I	26	TAD I	26	TAD I	26	ERR25
2466	TAD I	27	TAD I	27	TAD I	27	ERR26
2467	TAD I	28	TAD I	28	TAD I	28	ERR27
2468	TAD I	29	TAD I	29	TAD I	29	ERR28
2469	TAD I	30	TAD I	30	TAD I	30	ERR29
2470	TAD I	31	TAD I	31	TAD I	31	ERR30
2471	TAD I	32	TAD I	32	TAD I	32	ERR31
2472	TAD I	33	TAD I	33	TAD I	33	ERR32
2473	TAD I	34	TAD I	34	TAD I	34	ERR33
2474	TAD I	35	TAD I	35	TAD I	35	ERR34
2475	TAD I	36	TAD I	36	TAD I	36	ERR35

/THIS BANK IS OK

/NOW HANDLE THE RETURN

/INCREMENT AC TO FAILING CELL

2476	7001	ERR17,	IAC
2477	7001	ERR16,	IAC
2500	7001	ERR15,	IAC
2501	7001	ERR14,	IAC
2502	7001	ERR13,	IAC
2503	7001	ERR12,	IAC
2504	7001	ERR11,	IAC
2505	7001	ERR10,	IAC
2506	6202	CIF	00
2507	5310	JMP	00
2510	1023	TAD	K0010
2511	3147	DCA	REGC
2512	1547	TAD	1
2513	3151	DCA	REGD
2514	6201	CDF	00
2515	5322	JMP	FAL35
2516	6201	CDF	00
2517	6202	CIF	00
2520	5321	JMP	00
2521	4516	JMS	1
2522	4471	JMS	1
2523	7236	TS135M	ERROR
2524	7402	HLT	ERROR
2525	7610	SKP	CLA
2526	2405	TS135+5	TS135
2527	5200	JMP	TS135
2530	7340	CLA	CLL
2531	3145	DCA	REGA
2532	5733	JMP	1
2533	2600	TS136	00
2534	7777	END,	7777

/BACK TO BANK 0
 /TO LOWER MEMORY
 /ADD JUSTIFICATION
 /SAVE FAILING CELL
 /GET CONTENTS
 /SAVE IT
 /RESTORE DATA FIELD
 /TO ERROR MONITOR
 /RESTORE DATA FIELD
 /RESTORE INSTRUCTION FIELD
 /TO LOWER MEMORY
 /CHECK MONITOR
 /AUTO INDEX FAILED
 /MESSAGE POINTER
 /ERROR HALT
 /TO NEXT BANK
 /SCOPE LOOP
 /NEXT BANK
 /SET AC=7777
 /PRESET REGA
 /TO NEXT TEST
 /DONE THIS WAY TO AVOID PAGING ERRORS)

2692

```

/CLEAR AC
/FIND NEXT BANK
/DONE?
/YES, RELOCATE
/SAVE BANK
/ZERO REGS
/ZERO BANK
/TARGET BANK TO BE S
/NEXT BANK
/GET NEXT LINC FIELD
/DONE?
/YES, START TESTING
/SAVE 11
/FETCH 11
/JUSTIFY FOR 11 BITS
/JUSTIFY
/CLEAR LINK
/CLEAR BITS 2-11
/ADD 171 THIS WILL BE
/STORE
/GET BANK
/JUSTIFY
/CLOSE ENOUGH
/STORE
/GO RELOCATE PROGRAM
/BANK
/ORG
/DEST.
/LENGTH
/NEXT FIELD
/FIND TEST
/DONE?
/GO TYPE PASS ALARM
/SAVE TARGET
/FETCH 11
/MAKE 11 A LIF N
/STORE FOR EXECUTION
/FETCH TARGET
/MAKE 11 A LDF N
/STORE FOR EXECUTION
/GET 20
/MAKE A LUMP 20
/STORE FOR EXECUTION
/TO LMODE
/LIF N
/LDF N
/JUMP 20

```

```

/CLEAR AC
/FIND NEXT BANK
/DONE?
/YES, RELOCATE
/SAVE BANK
/ZERO REGS
/ZERO BANK
/TARGET BANK TO BE SET TO ZERO
/NEXT BANK
/GET NEXT LING FIELD
/DONE?
/YES, START TESTING
/SAVE IT
/FETCH IT
/JUSTIFY FOR IF BITS 3 & 4 TO MA 0.1
/CLEAR LINK
/CLEAR BITS 2-11
/ADD 171 THIS WILL BE THE TARGET ADDRESS-1

```

/ TO HERE IN PMODE IF INDEX OK
/

2657	6201	LOK,	CDF	00	/CHECK MONITOR
2660	4516	JMS I	ERROR		/AUTO-INDEX FAILED (DIRECT TO HERE FROM ERROR)
2661	4471	ERL36,	JMS I	ERROR	/MESSAGE POINTER
2662	7272		TS136M		/ERROR HALT
2663	7402		HLT		/TO NEXT FIELD
2664	7410		SKP		/SCOPE LOOP
2665	2653		EXAUT		/NEXT FIELD.
2666	5236		JMP	GOAUTO	

*4020
/LMODE (THIS PORTION IS RELOCATED FOR EACH FIELD)
/AUTO INDEX TEST (IF=DF)

LAUTO. SET 1 /SET UP REGISTERS

4020	0061	SET	1
4021	3777	SET	1
4022	0062	SET	2
4023	3777	SET	2
4024	0063	SET	3
4025	3777	SET	3
4026	0064	SET	4
4027	3777	SET	4
4030	0065	SET	5
4031	3777	SET	5
4032	0066	SET	6
4033	3777	SET	6
4034	0067	SET	7
4035	3777	SET	7
4036	0070	SET	10
4037	3777	SET	10
4040	0071	SET	11
4041	3777	SET	11
4042	0072	SET	12
4043	3777	SET	12
4044	0073	SET	13
4045	3777	SET	13
4046	0074	SET	14
4047	3777	SET	14
4050	0075	SET	15
4051	3777	SET	15
4052	0076	SET	16
4053	3777	SET	16
4054	0077	SET	17
4055	3777	SET	17
4056	0011	CLR	0
4057	4001	STC	0
4060	1020	LDA	20
4061	5252	5252	
4062	1040	STA	
4063	1777	1777	

/SET 0=0000
/PICK UP CONSTANT
/SET 1777=5252

/NOW TEST THE REGISTERS

21 CLR
LDA
AZE
LJMP ERL1
LDA
AZE
LJMP ERL1
LDA
AZE
LJMP ERL2
LDA
AZE
LJMP ERL3
LDA
AZE
LJMP ERL4
LDA
AZE
LJMP ERL5
LDA
AZE
LJMP ERL6
LDA
AZE
LJMP ERL7
LDA
AZE
LJMP ERL10
LDA
AZE
LJMP ERL11
LDA
AZE
LJMP ERL12
LDA
AZE
LJMP ERL13
LDA
AZE
LJMP ERL14
LDA
AZE
LJMP ERL15
LDA
AZE
LJMP ERL16
LDA
AZE
LJMP ERL17

4064
4065
4066
4067
4070
4071
4072
4073
4074
4075
4076
4077
4100
4101
4102
4103
4104
4105
4106
4107
4110
4111
4112
4113
4114
4115
4116
4117
4120
4121
4122
4123
4124
4125
4126
4127
4130
4131
4132
4133
4134
4135
4136
4137
4140
4141
6011
1021
4065
6172
1022
4070
1022
4071
0450
4072
6164
1023
4073
1023
LDA
AZE
LJMP ERL2
LDA
AZE
LJMP ERL3
LDA
AZE
LJMP ERL4
LDA
AZE
LJMP ERL5
LDA
AZE
LJMP ERL6
LDA
AZE
LJMP ERL7
LDA
AZE
LJMP ERL10
LDA
AZE
LJMP ERL11
LDA
AZE
LJMP ERL12
LDA
AZE
LJMP ERL13
LDA
AZE
LJMP ERL14
LDA
AZE
LJMP ERL15
LDA
AZE
LJMP ERL16
LDA
AZE
LJMP ERL17

```

/TO PMODE
/RESTORE OF
/SAVE ERROR
/RESTORE IF
/TO BANK 0
/RETURN
/ERROR POINTER
/END POINTER

```

/ALERT OPERATOR OF PASS COMPLETION (INHIBIT IF RSM 06=01)

4206	7300	PASS,	CLA CLL	REGA	/CLEAR REGA
4207	3145	DCA	REGA	00	/INCREMENT COUNT
4210	6201	CDF	ISZ	00	/DON'T SKIP
4211	2017	ISZ	COUNT	00	/GET SWITCHES
4212	7000	NOP			/PICK OUT BIT 06
4213	7604	LAS	AND	K0040	/SET ?
4214	0026	AND	SZA CLA		/YES, INHIBIT AND RESTART
4215	7640	SZA CLA	JMP	177	/GET POINTER TO TEXT
4216	5177	JMP	TAD	PNT0	/CHEAT MONITOR
4217	1137	TAD	ERROR		/GO TYPE MESSAGE
4220	3471	DCA I	JMP I	PASPNT	/MESSAGE POINTER
4221	5623	JMP I	TST37M		/LINKUP POINTER
4222	7323	LOC0,			
4223	5050	PASPNT,	ASCII		

5050	7240	ASCII, CLA CMA	/SET C(AC)=-1
5051	1620	TAD I	/GET MESSAGE ADDRESS STORAGE
5052	3014	DCA	/STORE IT IN AUTO INDEX REGISTER
5053	1220	TAD	/GET RETURN ADDRESS
5054	1115	TAD	/SUBTRACT LAST ERROR ADDRESS
5055	7650	SNA CLA	/TEST
5056	5362	JMP	/SAME GO TYPE DATA
5057	1414	TAD I	/GET FIRST CHARACTER
5060	3200	DCA	/SAVE IT
5061	1200	TAD	/GET IT
5062	7450	SNA	/TEST IT
5063	5225	JMP	/NUMBER=EXIT
5064	7040	CMA	/INVERT IT
5065	7450	SNA	/NUMBER=EXITA
5066	5314	JMP	/TYPE OUT DATA ROUTINE
5067	7040	CMA	/CHANGE IT BACK
5070	7112	RTR CLL	/SWAP AC TO THE RIGHT
5071	7012	RTR	/MOVE
5072	7012	RTR	/MOVE
5073	4277	JMS	/TYPE IT
5074	1200	TAD	/GET IT AGAIN
5075	4277	JMS	/TYPE IT
5076	5257	JMP	/MUST BE MORE WORDS THAT NEED TYPING
5077	0000	JMP	
5100	0030	AND	/SAVE SIGNIFICANT PART
5101	3157	DCA	/STORE WORD
5102	1157	TAD	/FETCH IT
5103	7650	SNA CLA	/TEST FOR 00 CRLF CODE
5104	4353	JMS	/YES IT WAS
5105	1157	TAD	/NO TYPE IT
5106	1377	TAD	/SUBTRACT 40
5107	7510	SPA	/TEST POLARITY
5110	1031	TAD	/ADD 340
5111	1376	TAD	/ADD 240
5112	4574	JMS I	/TYPE
5113	5677	JMP I	/EXIT

5114	1414	DATUM, TAD 1	PINT	NERROS	/GET ADDRESS OF REGISTER
5115	3200	DCA	NERROS	/STORE IN TEMP	
5116	1200	TAD	NERROS	/GET TEMP	
5117	7650	SNA CLA	JMP	/TEST FOR EXIT	
5120	5225	JMP	ASCRXT	/EQUALS 0000 EXIT	
5121	1200	TAD	NERROS	/GET TEMP	
5122	1373	TAD	M4444	/ADD CONSTANT	
5123	7650	SNA CLA	BELL	/TEST FOR RESTART	
5124	4467	JMS 1		/IT'S THERE! RESTART	
5125	1600	TAD 1	NERROS	/GET DATA	
5126	4332	JMS	OCTYP	/TYPE 11	
5127	1376	TAD	K240	/SPACE	
5130	4574	JMS 1	TYPE	/TYPE 11	
5131	5314	JMP	DATUM	/TYPE NUMERIC DATA	
5132	0000			/RETURN ADDRESS STORAGE	
5133	3277	DCA	TYPECH	/STORE DATA TO BE PRINTED	
5134	1100	TAD	K7774	/SET UP TALLY	
5135	3157	DCA	SPACE	/SET 11	

5136	HERE:	TAD	K1026	/GET FLAG NUMBER
5137	REDO:	DCA	CRLF	/STORE
5140		TAD	TYPECH	
5141		RAL		
5142		DCA	TYPECH	
5143		TAD	CRLF	
5144		RAL		
5145		SNL		
5146		JMP	REDO	
5147		JMS	TYPE	
5150		ISZ	SPACE	
5151		JMP	HERE	
5152		JMP	OC1YP	
5153	CRLF:	0		
5154		TAD	K0215	/RETURN ADDRESS STORAGE
5155		JMS	TYPE	
5156		TAD	K0212	/GET LF
5157		JMS	TYPE	
5160		TAD	K0177	/SET TO RUBOUT
5161		JMP	CRLF	/EXIT
5162	DATYP:	TAD	I	/GET A TERM OFF OF TYPE LIST
5163		SNA		/END OF LIST?
5164		JMP	ASGRXT	/YES EXIT
5165		CMA		/INVERT
5166		SEA	CLA	/BEGINNING OF DATA
5167		JMP	DATYP	/NO
5170		JMS	CRLF	/YES OK RETURN THE TTY CARRIAGE AND LINE FEED
5171		JMS	CLA	/CLEAR AC AND LINK
5172		JMP	DATUM	/GO TYPE THE DATA
5173	M4444:			/SWITCH CHECK
5174	K0215:			
5175	K0212:			
5176	K240:			
5177	M40:			

/RANDOM NUMBER GENERATOR

TAD
K5252

DCA RNA

TAD K5252

120 DCA
RNB

120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
841
842
843
844
845
846
847
848
849
850
851
852
853
854
855
856
857
858
859
860
861
862
863
864
865
866
867
868
869
870
871
872
873
874
875
876
877
878
879
880
881
882
883
884
885
886
887
888
889
890
891
892
893
894
895
896
897
898
899
900
901
902
903
904
905
906
907
908
909
910
911
912
913
914
915
916
917
918
919
920
921
922
923
924
925
926
927
928
929
930
931
932
933
934
935
936
937
938

0-1
0-1

UCAL
TAD
HNA
PNB

TAB 1
RND
PANDY

3755 0016

TST

JMP I TYP0UT

/INDIRECT RETURN

0000 0000

JMP 7-1


```

/CONTAINS CALLING
/CLEAR AC
/GET BANK ADDRESS
/RESET DATA FIELD
/SAVE ADDRESS
/BANK
/SAVE IT
/INCREMENT
/ORG-1
/SAVE IT
/INCREMENT
/DEST-1
/SAVE IT
/INCREMENT
/LENGTH
/COMPLEMENT
/SAVE IT
/INCREMENT
/SAVE RETURN
/GET BANK
/JUSTIFY
/SOME MORE
/SAVE BITS 06-08

```

/
 /BANK SET
 /CALL: LOCSET; BANK; REG8 HAS CONSTANT

5326	LOCSET, 0000		
5327	CLA CLL	LOCSET	/CLEAR AC
5330	TAD I		/GET BANK
5331	RTL		/JUSTIFY
5332	RAL		/SOME MORE
5333	AND	PMASK	/BITS 06-08
5334	TAD	KCDF	/ADD CDF
5335	DCA	EXCSET	/STORE FOR EXECUTION
5336	ISZ	LOCSET	/INCREMENT RETURN
5337	DCA	REGC	/ZERO REGC
5340	CDF	00	/RESET DATA FIELD
5341	TAD	REG8	/GET CONSTANT
5342	EXCSET, 0000		/EXECUTE CDF
5343	DCA I	REGC	/DEPOSIT C(REG8) IN BANK (N)
5344	ISZ	REGC	/DONE?
5345	JMP	PICSET	/NO, NEXT WORD
5346	CDF	00	/RESET DATA FIELD
5347	JMP I	LOCSET	/RETURN

*5400
/PMODE-LMODE
/INTERRUPT TEST: DO WE HAVE A SPURIOUS INTERRUPT ON-LINE?
/INTST, 0000

5400	0000	CLC CLC CMA	
5401	7340	DCA REGA	
5402	3145	TSC	
5403	6041	JMS I SETFLG	
5404	4556	LINC	
5405	6141	LDA 20	
5406	1020	/GET BIT 07	
5407	0020	/I/O PRESET	
5410	0004	/ESF	
5411	0002	/TO PMODE	
5412	5213	/CLEAR INHIBIT	
5413	5214	/CLEAR INHIBIT	
5414	7300	/ZERO AC, LINK	
5415	1140	/GET POINTER	
5416	3155	/SET UP RETURN	
5417	6001	/ENABLE INTERRUPTS	
5420	7000	/HALT	
5421	6002	/DISABLE INTERRUPTS	
5422	4516	/NO INTERRUPT ON-LINE	
5423	4471	/SPURIOUS INTERRUPT?	
5424	7340	/MESSAGE POINTER	
5425	7402	/ERROR HALT	
5426	7410	/RETURN	
5427	5401	/ISZ LOOP, SCOPE LOOP	
5430	5600	JMP I INTST	

LOOP,

/ERROR MESSAGES

5475 0024
5476 2324
5477 6061
5500 0003
5501 0406
5502 4017
5503 2240
5504 2204
5505 0640
5506 0601
5507 1114
5510 0504
5511 4050
5512 2015
5513 1704
5514 0551
5515 0023
5516 0516
5517 2440
5520 2203
5521 2604
5522 4000
5523 7777
5524 0146
5525 0147
5526 0000
5527 0024
5530 2324
5531 6062
5532 0003
5533 0406
5534 4017
5535 2240
5536 2204
5537 0640
5540 0601
5541 1114
5542 0504
5543 4050
5544 2015
5545 1704
5546 0551
5547 0023
5550 0516
5551 2440
5552 2203
5553 2604
5554 4000
5555 7777
5556 0146
5557 0147
5475
5476
5477
5500
5501
5502
5503
5504
5505
5506
5507
5510
5511
5512
5513
5514
5515
5516
5517
5520
5521
5522
5523
5524
5525
5526
5527
5530
5531
5532
5533
5534
5535
5536
5537
5540
5541
5542
5543
5544
5545
5546
5547
5550
5551
5552
5553
5554
5555
5556
5557

/TST01
/CDF OR RDF FAILED (PMODE)
/SENT RCVD

/TST02
/CDF OR RDF FAILED (PMODE)
/SENT RCVD

5560 0000 EXIT

TS103M, 0024

2324

6063

0014

5565

5566

2240

2240

0640

5571

5572

1114

5573

5574

4050

5575

5576

1415

1704

5577

5578

0406

5565

5566

4017

2240

2240

0640

5561

5560 0000

TS103M, 0024

2324

6063

5564

5565

5566

2240

2240

0640

5571

5572

1114

5573

5574

4050

5575

5576

1415

1704

5577

5578

0406

5565

5566

4017

2240

2240

0640

5561

5562

5563

5564

5565

5566

5567

5568

5569

5570

5571

5572

5573

5574

5575

5576

5577

5578

5579

5580

5581

5582

5583

5584

5585

5586

5587

5588

5589

5590

5591

5592

5593

5594

5595

5596

5597

5598

5599

5600

5601

5602

5603

5604

5605

5606

5607

5608

5609

5610

5611

5612

5613

5614

5615

5616

5617

5618

5619

5620

5621

5622

5623

5624

5625

5626

5627

5628

5629

5630

5631

5632

5633

5634

5635

5636

5637

5638

5639

5640

5641

5642

5643

5644

5645

5646

5647

5648

5649

5650

5651

5652

5653

5654

5655

5656

5657

5658

5659

5660

5661

5662

5663

5664

5665

5666

5667

5668

5669

5670

5671

5672

5673

5674

5675

5676

5677

5678

5679

5680

5681

5682

5683

5684

5685

5686

5687

5688

5689

5690

5691

5692

5693

5694

5695

5696

5697

5698

5699

5700

5701

5702

5703

5704

5705

5706

5707

5708

5709

5710

5711

5712

5713

5714

5715

5716

5717

5718

5719

5720

5721

5722

5723

5724

5725

5726

5727

5728

5729

5730

5731

5732

5733

5734

5735

5736

5737

5738

5739

5740

5741

5742

5743

5744

5745

5746

5747

5748

5749

5750

5751

5752

5753

5754

5755

5756

5757

5758

5759

5760

5761

5762

5763

5764

5765

5766

5767

5768

5769

5770

5771

5772

5773

5774

5775

5776

5777

5778

5779

5780

5781

5782

5783

5784

5785

5786

5787

5788

5789

5790

5791

5792

5793

5794

5795

5796

5797

5798

5799

5800

5801

5802

5803

5804

5805

5806

5807

5808

5809

5810

5811

5812

5813

5814

5815

5816

5817

5818

5819

5820

5821

5822

5823

5824

5825

5826

5827

5828

5829

5830

5831

5832

5833

5834

5835

5836

5837

5838

5839

5840

5841

5842

5843

5844

5845

5846

5847

5848

/TST05
/CDF OR RDP FAILED (PMODE)
/SENT RCVD

5645 0024 TST05H, 0024
5646 2324
5647 6065
5650 0003
5651 0406
5652 4017
5653 2240
5654 2204
5655 0640
5656 0601
5657 1114
5660 0504
5661 4050
5662 2015
5663 1704
5664 0551
5665 0023
5666 0516
5667 2440
5670 2203
5671 2604
5672 4000
5673 7777
5674 0146
5675 0147
5676 0000
EXIT

/TST06
/LDF OR RDP FAILED (LMODE)
/SENT RCVD

5677 0024 TST06H, 0024
5700 2324
5701 6066
5702 0014
5703 0406
5704 4017
5705 2240
5706 2204
5707 0640
5710 0601
5711 1114
5712 0504
5713 4050
5714 1415
5715 1704
5716 0551
5717 0023
5720 0516
5721 2440
5722 2203
5723 2604
5724 4000
5725 7777
5726 0146
5727 0147
5730 0000
EXIT

TS107M, 0024 2324 6067 0020 1517 0405 4011 1624 0522 2225 2024 4006 0111 1405 0400 EX17A EX17

TS108M, 0024 2324 6070 0020 1517 0405 4014 1701 0440 2306 4017 2240 2211 0240 0601 1114 0504 0040 0406 4040 4023 0600 EX17A REG8 REGC EX17

TS19AM, 0024 2324 7101 0014 1517 0405 4011 1624 0522 2225

751817

801511/

461517

2024 4006 0111 1405 EX17A
0024 2324 6071 0014 1517 0405 4014 1701 0440 2306 4017 2240 2211 0240 0601 1114 0504 0406 4040 4023 0600 EX17A
0024 2324 6160 0020 1517 4004 0640 0601 1114 4024 1740 3205 2217 4017 1640 0116 4011 1624

/TST109
 /LMODE
 /DL

/LMODE LOAD SF OR RIB FAILED / DF SF

```

/PMODE DF FAILED TO ZERO ON AN INTERRUPT
/SENT SF RCVD

```

6103	0522	6103	0522
6104	2225	6104	2225
6105	2024	6105	2024
6106	0023	6106	0023
6107	0516	6107	0516
6110	2440	6110	2440
6111	4023	6111	4023
6112	0640	6112	0640
6113	4022	6113	4022
6114	0326	6114	0326
6115	0400	6115	0400
6116	7777	6116	7777
6117	0146	6117	0146
6120	0147	6120	0147
6121	0151	6121	0151
6122	0000	6122	0000
6123	0024	6123	0024
6124	2324	6124	2324
6125	6161	6125	6161
6126	0014	6126	0014
6127	1517	6127	1517
6130	0405	6130	0405
6131	4004	6131	4004
6132	0640	6132	0640
6133	0001	6133	0001
6134	1114	6134	1114
6135	0504	6135	0504
6136	4024	6136	4024
6137	1740	6137	1740
6140	3205	6140	3205
6141	2217	6141	2217
6142	4017	6142	4017
6143	1640	6143	1640
6144	0116	6144	0116
6145	4011	6145	4011
6146	1624	6146	1624
6147	0522	6147	0522
6150	2225	6150	2225
6151	2024	6151	2024
6152	0023	6152	0023
6153	0516	6153	0516
6154	2440	6154	2440
6155	4023	6155	4023
6156	0640	6156	0640
6157	4022	6157	4022
6160	0326	6160	0326
6161	0400	6161	0400
6162	7777	6162	7777
6163	0146	6163	0146
6164	0147	6164	0147
6165	0151	6165	0151
6166	0000	6166	0000
6167	0024	6167	0024

TS11M, 0024

EXIT
REGD
REGC
REG8
EXITA

/TS111

/LMODE DF FAILED TO ZERO ON AN INTERRUPT
/SENT SF RCVD

TS112M, 0024

EXIT
REGD
REGC
REG8
EXITA

/TS112

7/14/67 SENT LOGN FIELD

/BANK LOCN SENT RCVD

79113

6170	2324	6177	0104	4024	4055	4011	0301	0304	0004	6162	6162	2324
6171	6162	6176	4024	4055	4011	0301	0304	0004	6162	6162	2324	2324
6172	3004	6175	4011	4055	4011	0301	0304	0004	6162	6162	2324	2324
6173	0301	6179	4011	4055	4011	0301	0304	0004	6162	6162	2324	2324
6174	4011	6176	4024	4055	4011	0301	0304	0004	6162	6162	2324	2324
6175	4055	6177	0104	4024	4055	4011	0301	0304	0004	6162	6162	2324
6201	4006	6204	4011	4024	4055	4011	0301	0304	0004	6162	6162	2324
6202	0111	6205	0611	4024	4055	4011	0301	0304	0004	6162	6162	2324
6203	1405	6206	1404	4024	4055	4011	0301	0304	0004	6162	6162	2324
6204	0400	6207	4014	4024	4055	4011	0301	0304	0004	6162	6162	2324
6205	0611	6210	1703	4024	4055	4011	0301	0304	0004	6162	6162	2324
6206	1404	6211	1640	4024	4055	4011	0301	0304	0004	6162	6162	2324
6207	1640	6212	2305	4024	4055	4011	0301	0304	0004	6162	6162	2324
6208	1624	6215	0326	4024	4055	4011	0301	0304	0004	6162	6162	2324
6209	4022	6216	0400	4024	4055	4011	0301	0304	0004	6162	6162	2324
6210	0326	6217	7777	4024	4055	4011	0301	0304	0004	6162	6162	2324
6211	0146	6218	0146	4024	4055	4011	0301	0304	0004	6162	6162	2324
6212	0076	6219	0076	4024	4055	4011	0301	0304	0004	6162	6162	2324
6213	0147	6220	0147	4024	4055	4011	0301	0304	0004	6162	6162	2324
6214	0000	6221	0000	4024	4055	4011	0301	0304	0004	6162	6162	2324
6215	0000	6222	0000	4024	4055	4011	0301	0304	0004	6162	6162	2324
6216	0000	6223	0000	4024	4055	4011	0301	0304	0004	6162	6162	2324
6217	0000	6224	0000	4024	4055	4011	0301	0304	0004	6162	6162	2324
6218	0000	6225	0000	4024	4055	4011	0301	0304	0004	6162	6162	2324
6219	0000	6226	0000	4024	4055	4011	0301	0304	0004	6162	6162	2324
6220	0000	6227	0000	4024	4055	4011	0301	0304	0004	6162	6162	2324
6221	0000	6228	0000	4024	4055	4011	0301	0304	0004	6162	6162	2324
6222	0000	6229	0000	4024	4055	4011	0301	0304	0004	6162	6162	2324
6223	0000	6230	0000	4024	4055	4011	0301	0304	0004	6162	6162	2324
6224	0000	6231	0000	4024	4055	4011	0301	0304	0004	6162	6162	2324
6225	0000	6232	0000	4024	4055	4011	0301	0304	0004	6162	6162	2324
6226	0000	6233	0000	4024	4055	4011	0301	0304	0004	6162	6162	2324
6227	0000	6234	0000	4024	4055	4011	0301	0304	0004	6162	6162	2324
6228	0000	6235	0000	4024	4055	4011						

6256	0076	K5252
6257	0147	REGC
6260	0000	EXIT
6264	0024	TS14M, 0024
6265	0014	
6266	0164	
6267	0014	
6270	0014	
6271	0014	
6272	0014	
6273	0014	
6274	0014	
6275	0014	
6276	0014	
6277	0014	
6300	0014	
6301	0014	
6302	0014	
6303	0014	
6304	0014	
6305	0014	
6306	0014	
6307	0014	
6310	0014	
6311	0014	
6312	0014	
6313	0014	
6314	0014	
6315	0014	
6316	0014	
6317	0014	
6318	0014	
6319	0014	
6320	0014	
6321	0014	
6322	0014	
6323	0014	
6324	0014	
6325	0014	
6326	0014	
6327	0014	
6328	0014	
6329	0014	
6330	0014	
6331	0014	
6332	0014	
6333	0014	
6334	0014	
6335	0014	
6336	0014	
6337	0014	
6338	0014	
6339	0014	
6340	0014	
6341	0014	
6342	0014	

/TS14

/LMODE JUMP SAVE RETURN FAILED FOR NORMAL JUMP

/TS15

/DJR FAILED TO INHIBIT JUMP SAVE

EXITA
4000
2605
2301
2040
2515
4012
1124
1102
1610
4011
2417
0440
1405
0111
4006
1222
0004
6165
2324
0024

6343	0000	EXIT
6344	0024	TS16M, 0024
6345	2324	
6346	6166	
6347	0014	
6350	1517	
6351	0405	
6352	4012	
6353	1520	
6354	4006	
6355	0111	
6356	1405	
6357	0440	
6360	2417	
6361	4003	
6362	1405	
6363	0122	
6364	4004	
6365	1222	
6366	4000	
6367	7777	EXITA
6370	0000	EXIT
6371	0024	TS17M, 0024
6372	2324	
6373	6167	
6374	0020	
6375	1517	
6376	0405	
6377	4012	
6400	2515	
6401	2040	
6402	0114	
6403	2405	
6404	2205	
6405	0440	
6406	0305	
6407	1414	
6410	4060	
6411	6060	
6412	6000	
6413	7777	EXITA
6414	0000	EXIT
6415	0024	TS18M, 0024
6416	2324	
6417	6170	
6420	0020	
6421	1517	
6422	0405	
6423	4011	
6424	1706	
6425	4001	
6427	1424	

/TS16

/LMODE JUMP FAILED TO CLEAR DJR

/TS17

/PMODE JUMP ALTERED CELL 0000

/TS18

/PMODE IOP ALTERED CELL 0000

6427	0522	0522
6430	0504	0504
6431	4003	4003
6432	0514	0514
6433	1440	1440
6434	6060	6060
6435	6060	6060
6436	4000	4000
6437	7777	7777
6440	0000	0000
6441	0024	TS119M, 0024
6442	2324	2324
6443	6171	6171
6444	0014	0014
6445	1517	1517
6446	0405	0405
6447	4011	4011
6448	1706	1706
6450	4001	4001
6452	1424	1424
6453	0522	0522
6454	0504	0504
6455	4003	4003
6456	0514	0514
6457	1440	1440
6460	6060	6060
6461	6060	6060
6462	4000	4000
6463	7777	7777
6464	0000	0000
6465	0024	TS120M, 0024
6466	2324	2324
6467	6260	6260
6470	0020	0020
6471	1517	1517
6472	0405	0405
6473	4012	4012
6474	2515	2515
6475	2040	2040
6476	0314	0314
6477	0501	0501
6500	2205	2205
6501	0440	0440
6502	0412	0412
6503	2200	2200
6504	7777	7777
6505	0000	0000
6506	0024	TS121M, 0024
6507	2324	2324
6510	6261	6261
6511	0004	0004
6512	1222	1222

/TS119

/LMODE 10F ALTERED CELL 0000

/TS120

/PMODE JUMP CLEARED DJR

/TS121

/DJR INHIBITED PMODE INTERRUPT SAVE

/TS122
/NON-EXISTANT MEMORY READ-BACK FAILED
/BANK DATA
/REGD REGC

4011 4011
6513 4011
6514 1610
6515 1102
6516 1124
6517 0504
6520 4020
6521 1517
6522 0405
6523 4011
6524 1624
6525 0522
6526 2225
6527 2024
6530 4023
6531 0126
6532 0500
6533 7777
6534 0000

TS122M, 0024

6535 0024
6536 2324
6537 6262
6540 0016
6541 1716
6542 5505
6543 3011
6544 2324
6545 0116
6546 2440
6547 1505
6550 1517
6551 2231
6552 4022
6553 0501
6554 0455
6555 0201
6556 0313
6557 4006
6560 0111
6561 1405
6562 0400
6563 0201
6564 1613
6565 4004
6566 0124
6567 0100
6570 7777
6571 0151
6572 0147
6573 0000

TS123M, 0000

6574 0000
6575 0024
6576 2324
6577 6264

TS124M, 0024

6578 0000
6579 0024
6580 2324
6581 6264

/RESERVED
/TS124

6582 0000
6583 0024
6584 2324
6585 6264

/CIF FAILED TO LOAD PROPER IF
/SENT RCVD

6600 0003

6601 1106

6602 4006

6603 0111

6604 1405

6605 0440

6606 2417

6607 4040

6610 1417

6611 0104

6612 4020

6613 2217

6614 2005

6615 2240

6616 1106

6617 0023

6620 0916

6621 2440

6622 2203

6623 2604

6624 4000

6625 7777

6626 0146

6627 0147

6630 0000

6631 0024

6632 2324

6633 6265

6634 0014

6635 1106

6636 4006

6637 0111

6640 1405

6641 0440

6642 2417

6643 4014

6644 1701

6645 0440

6646 2022

6647 1720

6650 0522

6651 4011

6652 0600

6653 2305

6654 1624

6655 4022

6656 0326

6657 0400

6660 7777

6661 0146

6662 0147

6663 0000

6664 0024

TS126M, 0024

EX11

REGC

REG8

EX11A

0400

0326

4022

1624

2305

0600

4011

0522

1720

2022

0440

1701

4014

2417

0440

1405

0111

4006

1106

0014

6265

2324

0024

TS125M, 0024

EX11

REGC

REG8

EX11A

4000

2604

2203

2440

0516

0023

1106

2240

2005

2217

4020

0104

1417

4040

2417

0440

1405

0111

4006

1106

0003

/TS126

/TS125

/LIF FAILED TO LOAD PROPER IF
/SENT RCVD

/CIF FAILED TO FIND PROPER MEMORY
/SENT RCVD

/TST27
/PMODE INTERRUPTS NOT INHIBITED BY CIF
/BANK

6665	2324	6667	0003	6670	1106	6671	4006	6672	0111	6673	1405	6674	0440	6675	2417	6676	4006	6677	1116	6700	0440	6701	2022	6702	1720	6703	0522	6704	4015	6705	0515	6706	1722	6707	3100	6710	2305	6711	1624	6712	4022	6713	0326	6714	0400	6715	7777	6716	0146	6717	0147	6720	0000	6721	0024	6722	2324	6723	6267	6724	0020	6725	1517	6726	0405	6727	4011	6730	1624	6731	0522	6732	2225	6733	2024	6734	2340	6735	1617	6736	2440	6737	1116	6740	1011	6741	0211	6742	2405	6743	0440	6744	0231	6745	4003	6746	1106	6747	4000	6750	0201	6751	1613	6752	4000
------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

6753	7777	EXITA
6754	0146	REGD
8755	0000	EXIT
8756	0024	TS128M, 0024
6757	2324	
6760	6270	
6761	0014	
6762	1517	
6763	0405	
6764	4014	
6765	1106	
6766	4006	
6767	0111	
6770	1405	
6771	0440	
6772	2417	
6773	4011	
6774	1610	
6775	1102	
6776	1124	
6777	4011	
7000	1624	
7001	0522	
7002	2225	
7003	2024	
7004	2300	
7005	0201	
7006	1613	
7007	4000	
7010	7777	EXITA
7011	0146	REGD
7012	0000	EXIT
7013	0024	TS129M, 0024
7014	2324	
7015	6271	
7016	0014	
7017	1517	
7020	0405	
7021	4012	
7022	1520	
7023	4060	
7024	4006	
7025	0111	
7026	1405	
7027	0440	
7030	2417	
7031	4003	
7032	1405	
7033	0122	
7034	4011	
7035	1624	
7036	0522	
7037	2225	

TS129
/LMODE JMP 0 FAILED TO CLEAR
/INTERRUPT INHIBIT

TS128
/LMODE LIF FAILED TO INHIBIT INTERRUPTS
/BANK

7040	2024	7041	4011
7042	1610	7043	1102
7044	1124	7045	4000
7046	0201	7047	1613
7048	4000	7049	1613
7050	4000	7051	7777
7052	0146	7053	0000
7054	0024	7055	2324
7056	6360	7057	0014
7058	0014	7059	1517
7060	0405	7061	0405
7062	4004	7063	1222
7064	5512	7065	1520
7066	4060	7067	4006
7068	0111	7069	0111
7070	1405	7071	0440
7072	2417	7073	4014
7074	1701	7075	0440
7076	1106	7077	0002
7100	0002	7101	0116
7102	1300	7103	7777
7104	0146	7105	0000

TS130H,
EXIT
REGB
EXITA

/TS130
/LMODE DJR-JMP 0 FAILED
/TO LOAD IF
/BANK

/TS132
/LMODE ION=LIIF FAILED TO
/INHIBIT INTERRUPTS

7106	0024	7107	2324
7110	6362	7111	0014
7112	1517	7113	0405
7114	4011	7115	1716
7116	5514	7117	1106
7120	4006	7121	0111
7122	1405	7123	0440

7124	2417	7124	0024	TST33M, 0024	7140	0024	2324	7141	2324	7142	6363	7143	0014	1517	0405	4014	1106	1106	5512	1520	4016	4006	7153	4006	7154	0111	1405	0440	2417	4014	1701	0440	2306	0040	1106	4040	7166	0440	7167	4004	0640	4040	7171	4040	7172	2306	7173	4004	7174	7777	0147	0152	7176	0151	7177	0151	7200	0000	7201	0024	TST34M, 0024	2324	6364	7203	6364	7204	0014	1517	0405	4022	7210	1506
------	------	------	------	--------------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	--------------	------	------	------	------	------	------	------	------	------	------	------

/TST34
/LMODE RMF IN EXTENDED
/BANK FAILED

/TST33
/LMODE LIF-JMP N FAILED TO LOAD SF
/ IF
OF SF

7211	4011	
7212	1640	
7213	0530	
7214	2405	
7215	1604	
7216	0504	
7217	4002	
7220	0116	
7221	1340	
7222	0601	
7223	1114	
7224	0504	
7225	0002	
7226	0116	
7227	1340	
7230	4023	
7231	0600	
7232	7777	EX17A
7233	0146	REG8
7234	0147	REGC
7235	0000	EXIT
7236	0024	TS135M, 0024
7237	2324	
7240	6365	
7241	0020	
7242	1517	
7243	0405	
7244	4001	
7245	2524	
7246	1755	
7247	1116	
7250	0405	
7251	3040	
7252	0601	
7253	1114	
7254	0504	
7255	0002	
7256	0116	
7257	1340	
7260	0305	
7261	1414	
7262	4001	
7263	0404	
7264	2200	
7265	7777	EX17A
7266	0146	REG8
7267	0147	REGC
7270	0151	REGD
7271	0000	EXIT
7272	0024	TS136M, 0024
7273	2324	
7274	6366	
7275	4014	

/TS135
/PMODE AUTO-INDEX FAILED
/BANK CELL ADDR

/TS136
/LMODE AUTO-INDEX FAILED
/FIELD LCN

7276	1517	7340	0023
7277	0405	7341	2025
7300	4001	7342	2211
7302	2524	7343	1725
7303	1755	7344	2340
7304	0405	7345	1116
7305	3040	7346	2405
7306	0601	7347	2222
7307	1114	7350	2520
7310	0504	7351	2441
7311	0006	7352	0050
7312	1105	7353	0310
7313	1404	7354	0503
7314	4014	7355	1340
7315	1703	7356	1117
7316	1600	7357	0340
7317	7777	7360	1157
7320	0146	7361	1740
7321	0147	7362	2022
7322	0000	7363	0523
7323	0005		
7324	3024		
7325	4015		
7326	0515		
7327	4024		
7330	2324		
7331	4020		
7332	0123		
7333	2355		
7334	5555		
7335	7777		
7336	0017		
7337	4444		

TEST37M

INST3M

EXITA
REGC
EXIT
0005
3024
4015
0515
4024
2324
4020
0123
2355
5555
EXITA
COUNT
EXITB

/EXT MEM TST PASS--(PASS)

/SPECIAL RESTART: EVENTUALLY GETS TO TST01

/SPURIOUS INTERRUPT!

/(CHECK 100 I/O PRESET)

/POP-12-EXTENDED MEMORY TEST, VERSION 2, MAINDEC 12-01AC-L PAL10 V141 8-OCT-70 10132 PAGE 57-18
 0524 0524 7364 0524
 5100 5100 7365 5100
 5000 5000 7366 5000
 EXIT

\$

3000
3100
3200
3300
3400
3500
3600
3700

ADD	2000	EXCSET	5342	LDA	1000	PMASK	0121
ASCII	5050	EXDF33	0072	LDF	0640	PNT30	2007
ASCRXT	5025	EXIF33	0073	LEND	4205	PNT30N	0141
AUTO 1	0015	EXIT	0000	LHAN	0042	PNTA	0122
AUTO12	0016	EXITA	7777	LIF	0600	PNTB	0123
AZE	0450	EXITB	4444	LINC	6141	PNTC	0124
BAK22	1300	FAL22	1310	LINTR	0040	PNTCA	0125
BANK	0066	FAL35	2522	LJMP	6000	PNTD	0126
BCL	1540	FLAG	5253	LMASK	0114	PNTE	0127
BELL	0067	GETBANK	0074	LNOP	0016	PNTF	0130
BELLS	5464	GETBNL	0075	LOCA	0502	PNTG	0131
BKSET	0070	GETNXL	5445	LOCB	0527	PNTH	0132
BSE	1600	GETNXT	5431	LOCC	0620	PNTI	0133
CLR	0011	GOAUTO	2636	LOGCA	0564	PNTJ	0134
COUNT	0017	HERE	5136	LOGD	0660	PNTK	0135
CRLF	5153	INCRCL	5313	LOGE	0722	PNTL	0136
DATUM	5114	INTSTM	7340	LOGF	1246	PNT0	0137
DATYP	5162	INTTST	5400	LOGG	1430	PNTP	0140
DEB+36	2633	IOB	0500	LOGH	1473	PNT	4204
END	2534	K0003	0021	LOGI	1605	PPOINT	0142
ERL1	4172	K0010	0023	LOGK	1734	PRANDOM	0144
ERL10	4156	K0017	0024	LOGL	2012	RANDY	5200
ERL11	4155	K0020	0025	LOGO	4222	READ0	1316
ERL12	4154	K0040	0026	LOGP	5423	READ1	1342
ERL13	4153	K0070	0027	LOCSET	5326	REDO	5137
ERL14	4152	K0077	0030	LOK	2657	REGA	0145
ERL15	4151	K0100	0031	LPOINT	0065	REGB	0146
ERL16	4150	K0177	0032	LREG	0064	REGC	0147
ERL17	4147	K0207	0033	LREG1	0013	REGCN	0150
ERL2	4164	K0212	5175	LSET	0050	REGD	0151
ERL3	4163	K0215	5174	LSKP	0456	REGF	0152
ERL36	2661	K0400	0034	LSTERH	0115	RELOC	5261
ERL4	4162	K1026	0035	M40	5177	RELOCB	0153
ERL5	4161	K1777	0036	M4444	5173	RELPT	0154
ERL6	4160	K2000	0037	MSTAR1	0177	RETURN	0155
ERL7	4157	K240	5176	NBANK	2611	RNA	5240
ERR10	2505	K5252	0076	NERROR	0116	RNB	5241
ERR11	2504	K6020	0077	NERROR5	5000	RNC	5242
ERR12	2503	K7774	0100	NOM1	0374	RND	5243
ERR13	2502	KCDF	0101	NOM2	0452	ROL	0240
ERR14	2501	KCIF	0102	OCTYP	5132	ROR	0300
ERR15	2500	KHLT	0103	OK35	2516	SET	0060
ERR16	2477	K108	0105	PASPN1	4223	SETFLG	0156
ERR17	2476	K10F	0106	PASS	4206	SPACE	0157
ERROR8	0071	KLOF	0104	PASSN	0117	SRO	1500
ERRORS	5020	KLIF	0111	PBANK	0120	STA	1040
EX29	1725	KLJMP	0112	PDP	0002	START	0200
EXAUT	2653	KLNOP	0107	PICKUP	5321	STC	4000
EXC12	0763	KRIE	0110	PICSET	5340	TST01	0213
EXC13	1022	LAUTO	4020	PINT	0014	TST01M	5475
EXCREL	5323	LBANK	0113	PINTR	0000	TST02	0240

TS125M	6631
TS126	1514
TS126M	6664
TS127	1536
TS127M	6721
TS127N	0165
TS128	1613
TS128M	6756
TS128N	0166
TS129	1663
TS129M	7013
TS130	1747
TS130M	7054
TS130N	0167
TS130X	1763
TS132	2033
TS132M	7106
TS132N	0170
TS132X	2043
TS133	2072
TS133M	7140
TS133N	0171
TS134	2152
TS134M	7201
TS134N	0172
TS135	2400
TS135M	7236
TS135N	0173
TS136	2600
TS136M	7272
TS136X	2530
TS137M	7323
TS19A	0550
TS19AM	6004
TS19N	0160
TYPE	0174
TYPECH	5077
TYPEOUT	5244
XDF33	2120
XDF33	2121
XSK	0220

TS102M	5527
TS103	0265
TS103M	5361
TS104	0315
TS104M	5613
TS105	0345
TS105M	5645
TS106	0413
TS106M	5677
TS107	0473
TS107M	5731
TS108	0512
TS108M	5752
TS109	0576
TS109M	6025
TS110	0643
TS110M	6057
TS111	0701
TS111M	6123
TS112	0746
TS112A	0755
TS112M	6167
TS112N	0161
TS113	1004
TS113A	1016
TS113M	6225
TS113N	0162
TS114	1044
TS114M	6261
TS115	1064
TS115M	6316
TS116	1105
TS116M	6344
TS117	1127
TS117M	6371
TS118	1145
TS118M	6415
TS119	1163
TS119M	6441
TS120	1204
TS120M	6465
TS121	1230
TS121M	6506
TS122	1262
TS122M	6535
TS123	1370
TS123M	6574
TS123N	0163
TS124	1403
TS124M	6575
TS124N	0164
TS125	1446

ERRORS DETECTED: 0

LINKS GENERATED: 0

RUN-TIME: 25 SECONDS

3K CORE USED

